NTS

PORTS

ERCE

RESS

ION

Am. B. 3040

(470)

Proceedings

69°

Jordan.

54TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 32.

SPECIAL CONSULAR REPORTS.

HIGHWAYS OF COMMERCE.

THE

OCEAN LINES, RAILWAYS, CANALS, AND OTHER TRADE ROUTES OF FOREIGN COUNTRIES.

VOL. XII.

ISSUED FROM THE BUREAU OF STATISTICS,
DEPARTMENT OF STATE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1895.

BIBLIOTHECA
REGIA
MONACENSIS

CONTENTS.

	Page.
Values of foreign coins	5–8
Foreign weights and measures	9–13
Railways and telegraphs of the world	16–18
AMERICA.	
Dominion of Canada:	
Introductory statistics	19–27
British Columbia	27–31
Manitoba	31–33
Ontario	33, 34
New Brunswick	35–37
Nova Scotia	37
Newfoundland	38
Prince Edward Island	38–41
Mexico	41–71
Central America:	
Guatemala	71
British Honduras	72
Honduras	73
Salvador	74
Nicaragua	75–78
Costa Rica	78
West Indies:	
Bahamas	79, 80
Bermuda	81
Cuba	81–85
Haiti	85
Santo Domingo	85
Puerto Rico	86
Jamaica	86, 87
South America:	
Intercontinental Railway	88, 89
Colombia	89–101
Panama Canal	101–103
Venezuela	103–106
British Guiana (*see also* Appendix)	106–108
Brazil	108–118
Ecuador	118–121
Peru	121–128
Bolivia	128–136
Chili	136–139
Paraguay	139–143
Uruguay	145, 146
Argentine Republic	146–152

EUROPE.

	Page.
United Kingdom	153–188
England	189–193
Liverpool, 189; London, 190; Southampton, 193.	
Wales	194–203
Scotland	204–214
Ireland	215–224
Belgium	224–235
Holland	235–239
Denmark	240–246
France	246–282
Spain (*see also* Appendix)	282–302
Gibraltar	303, 304
Germany	305, 331
Luxemburg	331–334
Switzerland	335–338
Austria-Hungary	338–355
Austria, 338; Bohemia, 344; Hungary, 348.	
Italy	355–386
Italy, 355; Mont Cenis Tunnel, 361; Genoa, 368; Palermo, 373.	
Greece	386–389
Turkey	389–392
Bulgaria	392, 393
Russia	393–421
St. Petersburg, 393; Odessa, 403; Great Siberian Railway, 409; Finland, 418.	
Norway	422–424
Sweden	425, 426

AFRICA.

Morocco	427–430
Algeria	431–438
Tunis	438–442
Tripoli	443–445
Egypt	445–451
Madagascar	451–457
Mauritius	457–460
Mozambique	460–467
Somali Coast (British)	468, 469
Zanzibar	470
Cape Colony	471–473
Orange Free State	473–476
Natal	477–480
Central Africa (British)	480–488
German Africa	489–496
Togoland, 489; Cameroons, 491; East and Southwest Africa, 493.	
Angola (Portuguese)	497–502
Congo Free State	502–507
Liberia	508
Sierra Leone	509–513
Senegal	513
Madeira	514, 515

ASIA.

Turkey in Asia	517–531
Asia Minor, 517; Bagdad, 518; Syria, 522; Palestine, 527.	
Maskat	531

Page

Persia 532–542
British India 543–570
Calcutta, 543; Bombay, 562.
Ceylon 570–577
Straits Settlements 578–584
Malay States 585
Selangor, 585; Sungie Ujong, 588; Perak, 590.
Dutch India 591–596
Java, 591; Sumatra, 596.
China 597–611
Shanghai, 597; Tientsin, 604; Hongkong, 608.
Japan 611–616
Korea 617
Cochin China 617
Philippine Islands 618–620

AUSTRALASIA.

New South Wales 620–627
Victoria 627–638
New Zealand 639–649

POLYNESIA.

New Caledonia 650
Fiji Islands 650-653
Tahiti 654
Hawaiian Islands 655–658

APPENDIX.

A. Ocean lines from United States ports 661–696
B. Dutch Guiana 696–698
C. Spanish railways 698–703
D. New tariff rates of Austrian State railways 703
E. Interior waterways of northwest Europe 704–728
F. Brazil (ocean lines and railroads) 729–743

MAPS.

Tracks for full-powered steamships ..... Frontispiece
Railroads, principal rivers, ports, and steamship lines in Mexico 41
Comparison of the Tehuantepec, Nicaragua, and Panama routes 54
Welsh coal fields 194
Railroads in the district of Genoa 371
Great Siberian Railway 418
Land and water routes of Madagascar 471
Natal Government Railways 478
Railways, telegraphs, and steamship routes of India 543

VALUES OF FOREIGN COINS.

The following statements show the valuation of foreign coins, as given by the Director of the United States Mint and published by the Secretary of the Treasury, in compliance with the first section of the act of March 3, 1873, viz: "That the value of foreign coins, as expressed in the money of account of the United States, shall be that of the pure metal of such coin of standard value," and that "the value of the standard coins in circulation of the various nations of the world shall be estimated annually by the Director of the Mint, and be proclaimed on the 1st day of January by the Secretary of the Treasury."

In compliance with the foregoing provisions of law, annual statements were issued by the Treasury Department, beginning with that issued on January 1, 1874, and ending with that issued on January 1, 1890. Since that date, in compliance with the act of October 1, 1890, these valuation statements have been issued quarterly, beginning with the statement issued on January 1, 1891.

These estimates "are to be taken (by customs officers) in computing the value of all foreign merchandise made out in any of said currencies, imported into the United States."

The following statements, running from January 1, 1874, to April 1, 1894, have been prepared to assist in computing the proper values in American money of the trade, prices, values, wages, etc., of and in foreign countries, as given in consular and other reports. The series of years are given so that computations may be made for each year in the proper money values of such year. In hurried computations, the reductions of foreign currencies into American currency, no matter for how many years, are too often made on the bases of latest valuations. When it is taken into account that the ruble of Russia, for instance, has fluctuated from 77.17 cents in 1874 to 37.2 cents in April, 1894, such computations are wholly misleading. All computations of values, trade, wages, prices, etc., of and in the "fluctuating-currency countries" should be made in the values of their currencies in each year up to and including 1890, and in the quarterly valuations thereafter.

To meet typographical requirements, the quotations for the years 1876, 1877, 1879, 1881, and 1882 are omitted, these years being selected as showing the least fluctuations when compared with years immediately preceding and following.

To save unnecessary repetition, the estimates of valuations are divided into three classes, viz: (A) countries with fixed currencies, (B) countries with fluctuating currencies, and (C) quarterly valuations of fluctuating currencies.

A.—*Countries with fixed currencies.*

Countries.	Standard.	Monetary unit.	Value in terms of United States gold.	Coins.
Argentine Republic*....	Gold and silver...	Peso	$0.96,5	Gold—Argentine ($4.82,4) and ½ Argentine; silver—peso and divisions.
Austria-Hungary†.....	Gold	Crown.....	.20,3	Gold—20 crowns ($4.05,2) and 10 crowns.
Belgium.....	Gold and silver...	Franc.....	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.54,6	Gold—5, 10, and 20 milreis; silver—½, 1, and 2 milreis.
British North America (except Newfoundland)).	..... do.....	Dollar.....	1.00	
Chile‡.....	Gold and silver....	Peso	.91,2	Gold—escudo ($1.82,4), doubloon ($4.56,1), and condor ($9.12,8); silver—peso and divisions.
Cuba.....	.....do.....	.....do.....	.92,6	Gold—doubloon ($5.01,7); silver—peso.
Denmark.....	Gold	Crown.....	.26,8	Gold—10 and 20 crowns.
Egypt.....	.....do.....	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland.....	.....do.....	Mark.....	.19,3	Gold—10 and 20 marks ($1.93 and $3.85,9).
France.....	Gold and silver....	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany.....	Gold	Mark.....	.23,8	Gold—5, 10, and 20 marks.
Great Britain.....	.....do.....	Pound sterling.....	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece.....	Gold and silver....	Drachma.....	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti.....	.....do.....	Gourde.....	.96,5	Silver—gourde.
Italy.....	.....do.....	Lira.....	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Liberia.....	Gold	Dollar.....	1.00	
Netherlands§.....	Gold and silver....	Florin.....	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland.....	Gold	Dollar.....	1.01,4	Gold—£2 ($2.02,7).
Portugal.....	Gold	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Spain.....	Gold and silver....	Peseta.....	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway...	Gold	Crown.....	.26,8	Gold—10 and 20 crowns.
Switzerland.....	Gold and silver....	Franc.....	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey.....	Gold	Piaster.....	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Venezuela.....	Gold and silver....	Bolivar.....	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

*In 1874 and 1875 the gold standard prevailed in the Argentine Republic. Its currency does not appear in the statements again until 1883, when the double standard prevailed, and the peso attained a fixed value of 96.5 cents.

† On reference to the table of "fluctuating currencies," it will be seen that Austria had the silver standard up to and including the quarter ending July 1, 1892. The next quarter (October 1) inaugurated the gold standard (*see* note under table of "fluctuating currencies").

‡ The gold standard prevailed in Chile until January 1, 1890. The value of the peso has been the same under both standards.

§ The Netherlands florin, as will be seen in the "fluctuating" table, became fixed in value (40.2 cents) in 1880.

B.—*Countries with fluctuating currencies, 1874–'90.*

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1874.	1875.	1878.	1880.	1883.	1884.
Austria-Hungary*.	Silver	Florin	$0.47,6	$0.45,3	$0.45,3	$0.41,3	$0.40,1	$0.39,8
Bolivia	do	Dollar until 1880; boliviano thereafter.	.96,5	.96,5	.96,5	.83,6	.81,2	.80,6
Central America	do	Peso	.96,5	.91,8	.91,8	.83,6	.....	.....
China	Silver	Haikwan tael	1.61	1.61	.....	.....	.....	.....
Colombia	do	Peso	.96,5	.96,5	.96,5	.83,6	.81,2	.80,6
Ecuador	do	do	.96,5	.91,8	.91,8	.83,6	.81,2	.80,6
Egypt†	Gold	Pound (100 piasters).	.....	.....	4.97,4	4.97,4	4.90	4.90
India	Silver	Rupee	.45,8	.43,6	.43,6	.39,7	.38,6	.38,3
Japan	Gold	Yen	.99,7	.99,7	.99,7	.99,7	.....	.....
	Silver		.....	.....	.....	.....	.87,6	.86,9
Mexico	do	Dollar	1.04,7½	.99,8	.99,8	.90,9	.88,2	.87,5
Netherlands‡	Gold and silver	Florin	.40,5	.38,5	.38,5	.40,2	.....	.....
Peru	Silver	Sol	.92,5	.91,8	.91,8	.83,6	.81,2	.80,6
Russia	do	Ruble	.77,17	.73,4	.73,4	.66,9	.65	.64,5
Tripoli	do	Mahbub of 20 piasters.	.87,09	.82,9	.82,9	.74,8	.73,3	.72,7

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1885.	1886.	1887.	1888.	1889.	1890.
Austria-Hungary*.	Silver	Florin	$0.39,3	$0.37,1	$0.35,9	$0.34,5	$0.33,6	$0.42
Bolivia	do	Dollar until 1880; boliviano thereafter.	.79,5	.75,1	.72,7	.69,9	.68	.85
Central America	do	Peso	.....	.....	.....	.69,9	.68	.85
Colombia	do	do	.79,5	.75,1	.72,7	.69,9	.68	.85
Ecuador	do	do	.79,5	.75,1	.72,7	.69,9	.68	.85
Egypt†	Gold	Pound (100 piasters).	4.90	4.90	4.94,3	4.94,3	4.94,3	4.93,3
India	Silver	Rupee	.37,8	.35,7	.34,6	.33,2	.32,3	.40,4
Japan	Gold	Yen	.....	.....	.99,7	.99,7	.99,7	.99,7
	Silver		.85,8	.81	.78,4	.75,3	.73,4	.91,7
Mexico	do	Dollar	.86,4	.81,6	.79	.75,9	.73,9	.92,3
Peru	Silver	Sol	.79,5	.75,1	.72,7	.69,9	.68	.85
Russia	do	Ruble	.63,6	.60,1	.58,2	.55,9	.54,4	.68
Tripoli	do	Mahbub of 20 piasters.	.71,7	.67,7	.65,6	.63	.61,4	.76,7

* The silver standard prevailed in Austria-Hungary up to 1892. The law of August 2 of that year (*see* CONSULAR REPORTS, No. 147, p. 623) established the gold standard.

† The Egyptian pound became fixed in value at $4.94,3 in 1887.

‡ The Netherlands florin fluctuated up to the year 1880, when it became fixed at 40.2 cents.

C.—*Quarterly valuations of fluctuating currencies, 1891–'94.*

Countries.	Monetary unit.	1892.				1893.			
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.	July 1.	Oct. 1.
Austria-Hungary *	Gold crown	.....	.....	.....	$0.20,3	.....	.....	.....	.....
	Silver florin	$0.34,1	$0.32,8	$0.32	.....	.....	.....	.....	.....
Bolivia	Silver boliviano.	.69,1	.66,5	.64,9	.61,6	$0.61,3	$0.61	$0.60,4	$0.53,1
Central America	Silver peso	.69,1	.66,5	.64,9	.61,6	.61,3	.61	.60,4	.53,1
China †	Shanghai tael.	1.02,1	.98,2	.95,8	.91	.90,6	.90,1	.89,2	.78,4
	Haikwan tael.	1.13,7	1.09,3	1.06,7	1.01,3	1.01	1.00,4	.99,4	.87,4
Colombia	Silver peso	.69,1	.66,5	.64,9	.61,6	.61,3	.61	.60,4	.53,1
Ecuador	do	.69,1	.66,5	.64,9	.61,6	.61,3	.61	.60,4	.53,1
India	Silver rupee	.32,8	.31,6	.30,8	.29,3	.29,2	.29	.28,7	.25,2
Japan ‡	Silver yen	.74,5	.71,6	.69,9	.66,4	.66,1	.65,8	.65,1	.57,3
Mexico	Silver dollar	.75	.72,2	.70,4	.66,9	.66,6	.66,2	.65,6	.57,7
Peru	Silver sol	.69,1	.66,5	.64,9	.61,6	.61,3	.61	.60,4	.53,1
Russia ⁂	Silver ruble	.55,3	.53,1	.51,9	.49,2	.49,1	.48,8	.48,3	.42,5
Tripoli	Silver mahbub.	.62,3	.60	.58,5	.55,5	.55,3	.55	.54,5	.47,9
Venezuela ‖	Silver bolivar	.13,8	.13,3	.13	.12,3	.....	.....	.....	.....

Countries.	Monetary unit.	1894.				1895.	
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.
Bolivia	Silver boliviano	$0.51,6	$0.46,5	$0.45,7	$0.46,4	$0.45,5	$0.44,1
Central America	Silver peso	.51,6	.46,5	.45,7	.46,4	.45,5	.44,1
China †	Shanghai tael.	.76,2	.68,6	.67,6	.68,5	.67.3	.65,2
	Haikwan tael.	.84,9	.76,5	.75,3	.76,3	.74,9	.75,6
	Tien-Tsin tael.	.....	.....	.....	.72,7	.71,4	.69,2
	Chefoo tael	.....	.....	.....	.71,7	.70,4	.68,3
Colombia	Silver peso	.51,6	.46,5	.45,7	.46,4	.45,5	.44,1
Ecuador	do	.51,6	.46,5	.45,7	.46,4	.45,5	.44,1
India	Silver rupee	.24,5	.22,1	.21,7	.22	.21,6	.21,0
Japan ‡	Silver yen	.55,6	.50,1	.49,3	.50	.49,1	.47,6
Mexico	Silver dollar	.56	.50,5	.49,7	.50,4	.49,5	.47,9
Peru	Silver sol	.51,6	.46,5	.45,7	.46,4	.45,5	.44,1
Russia ⁂	Silver ruble	.41,3	.37,2	.36,6	.37,1	.36,4	.35,3
Tripoli	Silver mahbub.	.46,5	.41,9	.41,3	.41,8	.41,1	.39,8

* Austria-Hungary had the silver standard up to August, 1892 (*see* note to "fluctuating" table B).

† China (silver). The Haikwan tael is the customs tael, and the Shanghai tael that used in trade. Consul-General Denny (CONSULAR REPORTS No. 43, p. 516) says: "The value of the tael varies in the different ports of China, and every port has two taels, one being the Government, or Haikwan, tael, in which all duties have to be paid, and the other the market tael, the former exceeding the latter by some 11 per cent."

‡ Gold is the nominal standard in Japan, but silver is practically the standard. The fixed value of the gold yen is 99.7 cents.

⁂ The gold ruble is valued at 77.2 cents. Silver is the nominal standard, but paper is the actual currency, and its depreciation is measured by the gold standard.

‖ The Venezuelan bolivar became fixed in value (19.3 cents) on January 1, 1892.

FOREIGN WEIGHTS AND MEASURES.

The following table embraces only such weights and measures as are given from time to time in CONSULAR REPORTS and in Commercial Relations:

Foreign weights and measures, with American equivalents.

Denominations.	Where used.	American equivalent.
Almude	Portugal	4.422 gallons.
Ardeb	Egypt	7.6907 bushels.
Are	Metric	0.02471 acre.
Arobe	Paraguay	25 pounds.
Arratel or libra	Portugal	1.011 pounds.
Arroba (dry)	Argentine Republic	25.3175 pounds.
Do	Brazil	32.38 pounds.
Do	Cuba	25.3664 pounds.
Do	Portugal	32.38 pounds.
Do	Spain	25.36 pounds.
Do	Venezuela	25.4024 pounds.
Arroba (liquid)	Cuba, Spain, and Venezuela	4.263 gallons.
Arshine	Russia	28 inches.
Arshine (square)	.....do	5.44 square feet.
Artel	Morocco	1.12 pounds.
Baril	Argentine Republic and Mexico	20.0787 gallons.
Barrel	Malta (customs)	11.4 gallons.
Do	Spain (raisins)	100 pounds.
Berkovet	Russia	361.12 pounds.
Bongkal	India	832 grains.
Bonw	Sumatra	7,096.5 square meters.
Bu	Japan	0.1 inch.
Butt (wine)	Spain	140 gallons.
Caffiso	Malta	5.4 gallons.
Candy	India (Bombay)	529 pounds.
Do	India (Madras)	500 pounds.
Cantar	Morocco	113 pounds.
Do	Syria (Damascus)	575 pounds.
Do	Turkey	124.7036 pounds.
Cantaro (Cantar)	Malta	175 pounds.
Carga	Mexico and Salvador	300 pounds.
Catty	China	1.333⅓ (1⅓) pounds.
Do	Japan	1.31 pounds.
Do	Java, Siam, Malacca	1.35 pounds.
Do	Sumatra	2.12 pounds.
Centaro	Central America	4.2631 gallons.
Centner	Bremen and Brunswick	117.5 pounds.
Do	Darmstadt	110.24 pounds.
Do	Denmark and Norway	110.11 pounds.
Do	Nuremberg	112.43 pounds.
Do	Prussia	113.44 pounds.
Do	Sweden	93.7 pounds.
Do	Vienna	123.5 pounds.
Do	Zollverein	110.24 pounds.
Do	Double or metric	220.46 pounds.
Chih	China	14 inches.
Coyan	Sarawak	3,098 pounds.
Do	Siam (Koyan)	2,667 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalent.
Cuadra	Argentine Republic	4.2 acres.
Do	Paraguay	78.9 yards.
Do	Paraguay (square)	8.077 square feet.
Do	Uruguay	Nearly 2 acres.
Cubic meter	Metric	35.3 cubic feet.
Cwt. (hundredweight)	British	112 pounds.
Dessiatine	Russia	2.6997 acres.
Do	Spain	1.599 bushels.
Drachme	Greece	Half ounce.
Dun	Japan	1 inch.
Egyptian weights and measures	(*See* CONSULAR REPORTS No. 144.)	
Fanega (dry)	Central America	1.5745 bushels.
Do	Chile	2.575 bushels.
Do	Cuba	1.599 bushels.
Do	Mexico	1.54728 bushels.
Do	Morocco	Strike fanega, 70 lbs. full fanega, 118 lbs.
Do	Uruguay (double)	7.776 bushels.
Do	Uruguay (single)	3.888 bushels.
Do	Venezuela	1.599 bushels.
Fanega (liquid)	Spain	16 gallons.
Feddan	Egypt	1.03 acres.
Frail (raisins)	Spain	50 pounds.
Frasco	Argentine Republic	2.5096 quarts.
Do	Mexico	2.5 quarts.
Fuder	Luxemburg	264.17 gallons.
Garnice	Russian Poland	0.88 gallon.
Gram	Metric	15.432 grains.
Hectare	.....do	2.471 acres.
Hectoliter:		
Dry	.....do	2.838 bushels.
Liquid	.....do	26.417 gallons.
Joch	Austria-Hungary	1.422 acres.
Ken	Japan	4 yards.
Kilogram (kilo)	Metric	2.2046 pounds.
Kilometer	.....do	0.621376 mile.
Klafter	Russia	216 cubic feet.
Kota	Japan	5.13 bushels.
Korree	Russia	3.5 bushels.
Last	Belgium and Holland	85 134 bushels.
Do	England (dry malt)	82.52 bushels.
Do	Germany	2 metric tons (4,480 pounds).
Do	Prussia	112.29 bushels.
Do	Russian Poland	11⅜ bushels.
Do	Spain (salt)	4,760 pounds.
League (land)	Paraguay	4,633 acres.
Li	China	2,115 feet.
Libra (pound)	Castilian	7,100 grains (troy).
Do	Argentine Republic	1.0127 pounds.
Do	Central America	1.043 pounds.
Do	Chile	1.014 pounds.
Do	Cuba	1.0161 pounds.
Do	Mexico	1.01465 pounds.
Do	Peru	1.0143 pounds.
Do	Portugal	1.011 pounds.
Do	Uruguay	1.0143 pounds.
Do	Venezuela	1.0161 pounds.
Liter	Metric	1.0567 quarts.
Livre (pound)	Greece	1.1 pounds.
Do	Guiana	1.0791 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalent.
Load	England (timber)	Square, 50 cubic feet; unhewn, 40 cubic feet; inch planks, 600 superficial feet.
Manzana	Costa Rica	1⅝ acres.
Marc	Bolivia	0.507 pound.
Maund	India	82⅔ pounds.
Meter	Metric	39.37 inches.
Mil	Denmark	4.68 miles
Do	Denmark (geographical)	4.61 miles.
Morgen	Prussia	0.63 acre.
Oke	Egypt	2.7225 pounds.
Do	Greece	2.84 pounds.
Do	Hungary	3.0817 pounds.
Do	Turkey	2.85418 pounds.
Do	Hungary and Wallachia	2.5 pints.
Pic	Egypt	21¼ inches.
Picul	Borneo and Celebes	135.64 pounds.
Do	China, Japan, and Sumatra	133⅓ pounds.
Do	Java	135.1 pounds.
Do	Philippine Islands (hemp)	139.45 pounds.
Do	Philippine Islands (sugar)	140 pounds.
Pie	Argentine Republic	0.9478 foot.
Do	Castilian	0.91407 foot.
Pik	Turkey	27.9 inches.
Pood	Russia	36.112 pounds.
Pund (pound)	Denmark and Sweden	1.102 pounds.
Quarter	Great Britain	8.252 bushels.
Do	London (coal)	36 bushels.
Quintal	Argentine Republic	101.42 pounds.
Do	Brazil	130.06 pounds.
Do	Castile, Chile, Mexico, and Peru	101.61 pounds.
Do	Greece	123.2 pounds.
Do	Newfoundland (fish)	112 pounds.
Do	Paraguay	100 pounds.
Do	Syria	125 pounds.
Do	Metric	220.46 pounds.
Rottle	Palestine	6 pounds.
Do	Syria	5¾ pounds.
Sagen	Russia	7 feet.
Salm	Malta	490 pounds.
Se	Japan	3.6 feet.
Seer	India	1 pound 13 ounces.
Shaku	Japan	10 inches.
Sho	do	1.6 quarts.
Standard (St Petersburg)	Lumber measure	165 cubic feet.
Stone	British	14 pounds.
Suerte	Uruguay	2,700 cuadras (*see* cuadra).
Tael	Cochin China	590.75 grains (troy).
Tan	Japan	0.25 acre.
To	do	2 pecks.
Ton	Space measure	40 cubic feet.
Tonde (cereals)	Denmark	3.94783 bushels.
Tondeland	do	1.36 acres.
Tsubo	Japan	6 feet square.
Tsun	China	1.41 inches.
Tunna	Sweden	4.5 bushels.
Tunnland	do	1.22 acres.
Vara	Argentine Republic	34.1208 inches.
Do	Castile	0.914117 yard.
Do	Central America	38.874 inches.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalent.
Vara	Chile and Peru	33.367 inches.
Do	Cuba	33.384 inches.
Do	Curaçao	33.375 inches.
Do	Mexico	33 inches.
Do	Paraguay	34 inches.
Do	Venezuela	33.384 inches.
Vedro	Russia	2.707 gallons.
Vergees	Isle of Jersey	71.1 square rods
Verst	Russia	0.663 mile.
Vlocka	Russian Poland	41.98 acres.

METRIC WEIGHTS AND MEASURES.

Metric weights.

Milligram ($\frac{1}{1000}$ gram) equals 0.0154 grain.
Centigram($\frac{1}{100}$ gram) equals 0.1543 grain.
Decigram ($\frac{1}{10}$ gram) equals 1.5432 grains.
Gram equals 15.432 grains.
Decagram (10 grams) equals 0.3527 ounce.
Hectogram (100 grams) equals 3.5274 ounces.
Kilogram (1,000 grams) equals 2.2046 pounds.
Myriagram (10,000 grams) equals 22.046 pounds.
Quintal (100,000 grams) equals 220.46 pounds.
Millier or tonnea—ton (1,000,000 grams) equals 2,204.6 pounds.

Metric dry measure.

Millimeter ($\frac{1}{1000}$ liter) equals 0.061 cubic inch.
Centiliter ($\frac{1}{100}$ liter) equals 0.6102 cubic inch.
Deciliter ($\frac{1}{10}$ liter) equals 6.1022 cubic inches.
Liter equals 0.908 quart.
Decaliter (10 liters) equals 9.08 quarts.
Hectoliter (100 liters) equals 2.838 bushels.
Kiloliter (1,000 liters) equals 1.308 cubic yards.

Metric liquid measure.

Millimeter ($\frac{1}{1000}$ liter) equals 0.27 fluid ounce.
Centiliter ($\frac{1}{100}$ liter) equals 0.338 fluid ounce.
Deciliter ($\frac{1}{10}$ liter) equals 0.845 gill.
Liter equals 1.0567 quarts.
Decaliter (10 liters) equals 2.6417 gallons.
Hectoliter (100 liters) equals 26.417 gallons.
Kiloliter (100 liters) equals 264.17 gallons.

Metric measures of length.

Millimeter ($\frac{1}{1000}$ meter) equals 0.0394 inch.
Centimeter ($\frac{1}{100}$ meter) equals 0.3937 inch.
Decimeter ($\frac{1}{10}$ meter) equals 3.937 inches.
Meter equals 39.37 inches.

Decameter (10 meters) equals 393.7 inches.
Hectometer (100 meters) equals 328 feet 1 inch.
Kilometer (1,000 meters) equals 0.62137 mile (3,280 feet 10 inches).
Myriameter (10,000 meters) equals 6.2137 miles.

Metric surface measures.

Centare (1 square meter) equals 1,550 square inches.
Are (100 square meters) equals 119.6 square yards.
Hectare (10,000 square meters) equals 2.471 acres.

HIGHWAYS OF COMMERCE.

On the 10th of April, 1894, the Department of State sent a circular to consular officers instructing them to prepare reports on the great through lines of traffic, by land and water, in their districts. The circular said:

In case of statements for an entire year, the calendar year 1893 should be preferentially covered.

No traffic line need be mentioned unless it carries passengers, through mails, or freight in very considerable quantities, the purpose of these reports being to supply to American merchants, travelers, and students authentic information concerning the great highways of traffic and travel. Neither subsidiary lines nor military lines, as such, need be discussed.

The great through lines should be reported upon under the heads, "Ocean lines" (including great coastwise lines), "Railways," "Navigable rivers and canal lines," and "First-class highways" (paved or macadamized).

The following interrogatories indicate the kind and the extent of the information desired:

1. Who controls the respective lines (government, corporations, etc.)?
2. What are the termini and the main points touched?
3. What is the length of the total line, and what are the distances between main points?
4. What is the condition of the line?
5. What (in the case of ocean lines and important coast, river, and canal lines) is the number of vessels; what their size and power?
6. What (in the case of railways) is the number of tracks?
7. What (in the case of highways) is the width?
8. How frequent is the communication on each line?
9. What are the rates (first class) for passengers, and for freight by the ton or kilogram, both between termini and intermediate points? Reserve terminal charges (so called) for future treatment, but report on through traffic and short hauls.

Roads overcoming great obstacles (by grade, bridges, etc.) should be specially mentioned, and accurate historical notes upon important highways would be appreciated.

The following reports in answer to the circular had been received up to July 10, 1895. In cases where no replies to the circular were forthcoming, or where it was impossible to obtain original information, owing to the fact that no consular representatives of the United States were stationed in the localities described, such matter as was procurable has been given, the sources being indicated either by footnotes or in the body of the text.

RAILWAYS AND TELEGRAPHS OF THE WORLD.

1. RAILWAYS.

The minister of public works for the German Empire has recently published the annual Railway Record. The statistics are based upon facts existing on December 31, 1892. At that date, the total length of all the railways of the world amounted to 406,348¾ miles, or more than sixteen times the circumference of the earth at the equator.

In the apportionments by continents, America occupies first rank with 218,871½ miles, or 31,394¼ miles more than the remainder of the world. Europe has 144,359 miles of railway, while Asia, notwithstanding its immense size, counts only 23,219½ miles. Africa has 7,212½ miles, and Australia 12,685 miles of iron road.

The following table gives the figures for various European countries:

Countries.	Length of railways, in miles.	Miles of railway per 100 square miles.	Miles of railway per 10,000 inhabitants.
Germany	27,451	13.084	5.45
Austria-Hungary	17,621	7.313	4.44
Great Britain and Ireland	20,321	16.778	5.16
France	24,014	11.229	6.26
Russia	19,622	.936	2.05
Italy	8,496	7.678	2.74
Belgium	3,379	29.710	5.45
Spain	6,769	3.456	3.93

The other countries of Europe combined have a total of 16,655½ miles of road, making a total of 144,359 miles, as already stated, for all Europe, with a proportion of 3.829 miles per 100 square miles, and of 4.22 miles per 10,000 inhabitants.

Of the 218,871½ miles opened in America, the United States alone possesses 174,747 miles,[1] with a proportion of 4.913 miles per 100 square miles, and of 25.12 miles per 10,000 inhabitants. Next come Canada and the British Provinces with 14,866 miles, or 0.436 mile per 100 square miles, and 30.66 miles per 10,000 inhabitants. There are in Mexico 6,624 miles of railway; in Brazil, 6,388 miles, and in the Argentine Republic, 8,161⅓ miles.

[1] Poor's Manual of Railroads gives the mileage of railways in the United States as 175,204 and 177,753 miles, at the close of the calendar years 1892 and 1893, respectively. The Statistician and Economist, for 1895–96, gives the railway mileage of the United States at the close of the calendar year 1894 as 189,576, and the total mileage of the world at 423,923.

Of the 23,219 miles of railway in Asia, 17,715 miles are located in the British East Indies. In Africa, the French possessions have 1,984 miles and Cape Colony 2,443⅓ miles.

The financial statistics relative to the subject are interesting. It is estimated that these 406,348¾ miles of railway have cost $33,655,340,000, which makes the average cost per mile $82,823.73. The total length of European railways has cost $17,505,100,000, being an average cost of $121,260.88 per mile.

In the countries about to be mentioned, the average price per mile has been as indicated by the following table, which also gives the total amount invested in railways:

Countries.	Average cost per mile.	Total amount invested in railways.
France	$131,859.96	$3,166,485,079.44
Great Britain and Ireland	131,047.76	2,663,021,530.96
Belgium	130,984.08	442,585,206.32
Italy	114,593.99	973,590,539.04
Austria-Hungary	95,391.47	1,680,893,092.87
Germany	95,194.23	2,613,176,807.73
Russia	90,414.18	1,756,107,039.96

The 261,989½ miles of the other portions of the globe represent a total sum of $16,152,170,000, with an average cost of $61,651.85 per mile. The cheapest railways are in Australia, where, in the western portion, the price falls as low as $21,723 per mile.

The United States share in the figures above mentioned to the amount of $10,362,170,000, with an average cost per mile of $59,298.12.

The total cost for Canada has been $856,148,000, or an average of $57,591 per mile.

2. TELEGRAPHS.

Another authority gives the total length of telegraph wires as 1,062,543 miles,[1] of which 380,278 miles are in Europe, 545,625 in America, 67,481 in Asia, 21,562 in Africa, and 47,535 miles in Australia.

The United States has the largest number of miles of wires, there being 403,891 miles, or more than the total for all Europe.

The following statement shows the mileage by countries:

	Miles.		Miles.
United States	403,891	Canada	32,311
Russia	80,778	Italy	24,233
Germany	73,322	Turkey	20,505
France	59,652	Argentine Republic	18,641
Austria-Hungary	42,999	Spain	16,158
British East Indies	39,146	Chile	15,845
Mexico	37,904	Belgium	4,624
United Kingdom	34,175		

[1]The Statistician and Economist, for 1895–96, gives the following telegraphic figures: Total telegraph lines of the world, 904,701 miles; total miles of wire, 2,682,583. Total miles of telegraph in the United States at the close of 1894, 190,303; total miles of wire in the United States, 790,792.

Divisions and countries.	Number of miles per 100 square miles.	Number of miles per 10,000 inhabitants.	Divisions and countries.	Number of miles per 100 square miles.	Number of miles per 10,000 inhabitants.
The world	*2.06	0.708	COUNTRIES—continued.		
DIVISIONS.			Great Britain and Ireland	28.217	8.544
Europe	10	10.870	Italy	21.899	7.573
America	3.495	49.602	Austria-Hungary	17.846	10.238
Asia	.332	.848	Turkey	16.274	12.612
Africa	.187	1.047	United States	11.354	62.137
Australia	1.359	15.845	Spain	8.237	8.976
COUNTRIES.			Chile	6.169	62.727
			Mexico	5.046	34.458
			British Indies	4.534	1.957
Belgium	40.622	7.700	Russia	3.572	8.503
Germany	34.946	14.664	Argentine Republic	1.702	46.602
France	29.228	14.913	Canada	.932	53.852

*Only land surfaces are considered in obtaining this result; in the subsequent calculations, all the larger bodies of water have been excluded.

HENRY C. MORRIS,
Consul.

GHENT, *November 26, 1894.*

NORTH AMERICA.

DOMINION OF CANADA.

INTRODUCTORY.[1]

Canada has a system of canal, river, and lake navigation over 2,700 miles in length, and vessels from the lake ports reach the Atlantic without breaking bulk. Up to 1891, $61,000,000 had been spent on canals for construction alone. In 1892, 25,105 vessels, of 4,273,760 tons, passed through the Canadian canals, carrying 152,439 passengers and 3,031,736 tons of freight, chiefly grain, timber, and coal.

The Dominion of Canada had a network of railways of a total length of 15,320 miles completed at the end of June, 1893, being a considerable increase over that of 1891. The number of miles in operation was 15,020. A considerable extent of railway is in course of construction, and concessions have been granted by Government for upward of 4,000 miles more. The Canadian Pacific Railway main line, from Montreal to Vancouver, is 2,906 miles in length. By means of this railway and a line of Pacific steamers, subsidized by the Imperial and Dominion Governments, Montreal and Yokohama have been brought within fourteen days of one another, and the journey from Liverpool to Yokohama is accomplished in less than twenty-one days. An experimental service has also been established between Australia and British Columbia, the first steamer, the *Miowera*, arriving at Vancouver from Sydney, New South Wales, on June 8, 1893, with mails, passengers, and freight.

The traffic on Canadian railways in 1892 and 1893 was:

Year.	Miles of railway.	Passengers.	Tons of freight carried.	Receipts.	Expenses.	Net profits.	Capital paid up.
1892.....	14,588	13,533,414	22,189,923	$51,685,768	$36,488,228	$15,197,540	$844,991,750
1893.....	15,020	13,618,027	22,003,599	52,042,397	36,616,033	15,426,364	872,156,476

In 1893, of the capital paid up, $147,212,610 represented Federal Government aid, and $42,148,313 aid from provincial governments and municipalities.

On June 30, 1893, there were 8,437 post offices in the Dominion. A uniform rate of postage of 3 cents has been established over the whole Dominion. The number of money-order offices in Canada in 1893 was

[1] From the Statesman's Year Book for 1895.

1,168. Since confederation, in 1867, the number of offices has doubled, and the number of orders sent is more than eight times as many.

There were 31,841 miles (2,709 being Government) of telegraph lines in Canada in 1893, and 69,111 miles of wire, with 2,692 offices. There were, in 1893, 44,000 miles of telephone wires, and 33,500 sets of instruments.

THE CANAL SYSTEM OF CANADA.[1]

The St. Lawrence River, and the Great Lakes, whose waters flow through it into the Atlantic, form a continuous waterway extending from Fond du Lac, at the head of Lake Superior, to the straits of Belle Isle, a distance of 2,384 miles. Along its course, at convenient distances, is abundant water power, and in its numerous bays and inlets are safe and commodious harbors.

Emptying into the St. Lawrence and contributing to the volume of its waters, as well as to the importance of its trade, are the Ottawa and Richelieu rivers, the former bringing it into communication with the immense lumber forests of Ontario, and the latter connecting it with Lake Champlain in the United States. These rivers were the thoroughfares in peace and the base lines in war for the Indian tribes long before the white man appeared on the Western Hemisphere. Upon their broad bosoms, the first explorers and voyagers pushed their adventurous way into the heart of this northern country, and opened it to commerce and civilization.

The early colonists of Canada found them the convenient and almost the only channels of intercourse among themselves and with the home country. Supplies were brought up the St. Lawrence in seagoing vessels to Quebec and Montreal, and thence distributed to the scattered settlements throughout the country.

Indian canoes, richly laden with furs and pelts, and later, batteaux and Durham boats, freighted with the surplus grain of the colonists, and lumber rafts from the Upper Ottawa and the lakes, floated down the Ottawa and the St. Lawrence to Montreal, Three Rivers, and Quebec, where their cargoes were exchanged for the comforts and necessaries of life brought from France. The St. Lawrence was navigable for seagoing vessels as far as Montreal, but between Montreal and the foot of Lake Ontario, there was a succession of rapids separated by navigable reaches. On account of the rapidity of the current, these rapids are impassable to boats of any size ascending the river, but most of them can be passed on the downward trip by vessels not too heavily loaded and built strongly enough to resist the strain of the whirling waters.

The head of navigation on the Ottawa River is the city of Ottawa, now the capital of the Dominion, but formerly known as Bytown.

---

[1] Extracts from report by Consul-General Stearns, of Montreal, printed in Consular Reports, No. 42, June, 1884. Reprinted in Special Consular Reports, "Canals and Irrigation," 1891.

Between this city and the mouth of the river at the southern extremity of the Island of Montreal, there are several impassable rapids.

The Richelieu, which is, as I have said, the outlet of Lake Champlain, was also so much obstructed at various points as to be unavailable for navigation.

A list of the various rapids on the St. Lawrence, Ottawa, and Richelieu, with a statement showing their length and that of the navigable reaches between them, will be found in Appendices A, B, and C.

The canal system of Canada, both in its entirety and its separate parts, has been established to overcome these obstructions, and, by artificial channels at various points, to render freely navigable the natural routes of transportation. By means of it, the whole St. Lawrence system, from Lake Erie to the sea, has been made passable by a connecting chain of canals, comprising 71¾ miles of artificial navigation, the least depth of which is 9 feet; a line of communication established between the St. Lawrence at Montreal and Lake Ontario at Kingston, by way of the Ottawa and the Rideau River, and a passage opened from the St. Lawrence to Lake Champlain and the United States.

APPENDIX A.—*Table of distances, sections of navigation, and obstructions on the St. Lawrence route.*

From—	To—	Sections of navigation.	Distance.	Obstructions.
			Miles.	
Montreal	Lachine	Lachine Canal	8¾	Lachine Rapids.
Lachine	Melocheville	Lake St. Louis	15¼	
Melocheville	Valleyfield	Beauharnois Canal	11¼	Cascades, Coteau and Cedar Rapids.
Valleyfield	Cornwall	Lake St. Francis	32¾	
Cornwall	Dickinsons Landing	Cornwall Canal	11½	Long Sault Rapids.
Dickinsons Landing	Farrans Point	River St. Lawrence	5	
Farrans Point	Croyles Island	Farrans Point Canal	¾	Rapids.
Croyles Island	Morrisburg	River St. Lawrence	10½	
Morrisburg	Rapide Plat	Rapide Plat Canal	4	Rapide Plat Rapids.
Head of Rapide Plat	Iroquois Village	River St. Lawrence	4½	
Iroquois Village	Galops Rapids	Galops Canal	7⅝	Galops Rapids.
Head Galops Rapids	Prescott	River St. Lawrence	7⅜	
Prescott	Kingston	River St. Lawrence	59	
Kingston	Port Dalhousie	Lake Ontario	170	
Port Dalhousie	Port Colborne	Welland Canal (old)	27	Niagara River and Falls.
Port Dalhousie	Port Colborne	Welland Canal (enlarged)	26¾	

APPENDIX B.—*Table of distances, sections of navigation, and obstructions on the Montreal, Ottawa and Kingston route.*

From—	To—	Sections of navigation.	Distance.	Obstructions.
			Miles.	
Montreal	Lachine	Lachine Canal	8¾	
Lachine	St. Anne's Canal	Lake St. Louis	14½	
Foot of St. Anne's Canal and lock.	Head of St. Anne's Canal and lock.	St. Anne's Canal	⅛	St. Anne's Rapids.
Head of St. Anne's Canal and lock.	Foot of Carillon Canal.	Lake of Two Mountains and River Ottawa.	27	
Foot of Carillon Canal.	Head of Carillon Canal.	Carillon Canal	¾	Carillon Rapids.
Head of Carillon Canal.	Grenville Canal	River Ottawa	6⅞	
Foot of Grenville Canal.	Head of Grenville Canal.	Grenville Canal	5¾	Long Sault Rapids.
Head of Grenville Canal.	Ottawa City	River Ottawa	56	
Ottawa City	Kingston	Rideau Canal	126¼	Rapids and shallows and falls.

APPENDIX C.—*Table of distances, sections of navigation, and obstructions on the Lake Champlain route.*

From—	To—	Sections of navigation.	Distance.	Obstructions.
			Miles.	
Montreal	Sorel	River St. Lawrence	46	
Sorel	St. Ours	River Richelieu	14	
St. Ours		St. Ours lock and dam		St. Ours Rapids.
St. Ours Lock	Chambly Basin	River Richelieu	32	
Chambly Basin	St. Johns	Chambly Canal	12	Chambly Rapids.
St. Johns	Rouse Point	River Richelieu	23	

APPENDIX D.—*Table showing length of each canal, number and dimensions of locks, and dimensions and tonnage of vessels which can pass them.*

Canals.	Length.	No. of locks.	Lockage.	Locks.			Vessels passing through.			
				Length.	Breadth.	Depth.	Length.	Breadth.	Draft.	Tonnage.
	Miles.		*Feet.*							
Lachine	8¾	5	45	270	45	12	250	44	12	1,000 to 1,500
Beauharnois	11¼	9	82½	200	45	9	180	44	9	700
Cornwall	11½	7	48	200	55	9	180	54	9	750
Williamsburg	12	6	29⅝	200	45	9	180	44	9	800
Welland (new)	26¾	26	326¾	270	45	12	250	44	12	1,000 to 1,500
St. Ours lock	.....	1	5	200	45	7	180	41	7	600
Chambly	8	9	74	118	23½	7	140	23	6½	230
St. Anne's lock		1	2	200	45	9	180	44	9	700
Carillon		2	12½	200	45	9	180	44	9	700
Grenville	5	5	45	200	45	9	180	44	9	700
Rideau	126¼	47	(1)	134	33	5	120	31½	4½	250

[1] Rise, 282¼; fall, 164; total, 446¼.

NOTE.—The depth given is the average depth at low water. When the water is unusually low this depth can not be maintained, and the capacity of the canals is reduced.

CANAL DEVELOPMENT.[1]

Previous to confederation, the canals in Canada were owned by the provincial governments.

In 1867, the union of the provinces was effected and they became the property of the Dominion Government, subject to the control of the department of inland revenue, but their construction, maintenance, and repairs are provided for by the department of railroads and canals. The St. Lawrence and Welland Canal systems, in conjunction with the Sault Ste. Marie Canal and the Great Lakes, give an unbroken water communication from Duluth via Montreal to Liverpool, a distance of 4,618 miles, of which 71 miles are artificial navigation.

In 1841, the system of canals between Montreal and Lake Ontario was contemplated with a view of securing a depth of 9 feet at all stages of the St. Lawrence waters.

The St. Lawrence River, however, is from various causes subject to fluctuations, the extent of which it seems was not determined with precision at the time when the canals were originally constructed.

[1] Report by Commercial Agent Leishman, of Morrisburg, printed in Special Consular Reports, "Canals and Irrigation," 1891.

The observations and experience of subsequent years have proven that while the intermediate river affords a sufficient depth for vessels drawing 9 feet, in the canals themselves at certain periods of low water that depth can not be maintained, the bottom not having been sunk to an adequate low depth.

The Dominion canals constructed between Montreal and Lake Erie are the Lachine, Beauharnois, Cornwall, Farrans Point, Rapide Plat, Galops, and Welland. The aggregate length of these canals is 70½ miles, the total height overcome by locks is 533¼ feet, and the number of locks is fifty-three. The greatest navigable depth is 14 feet, and that at present is to be found only in the Welland Canal, which was opened for the first time for 14-foot navigation during the season of 1888.

In the year 1871, it was decided by the Dominion Government to enlarge the canals on the St. Lawrence route, and it was subsequently determined that such a depth should be secured as would accommodate vessels of 14 feet draft. In conformity with this scheme of enlargement, all permanent structures, such as locks, bridges, etc., which are being built are required to be of such proportions as will accommodate vessels of 14 feet draft. The new locks are 270 feet long between the gates, 45 feet wide, and with a clear depth of 14 feet of water on the sills. The walls are of dressed stone, backed up with large, flat-bedded stones, and laid throughout in hydraulic cement. The face stones are laid in regular courses, the thickest course being at the bottom and diminishing upward in regular succession. The foundation timbers are pine, 12 inches square, and covered with two thicknesses of planks.

Lachine Canal.—The Lachine Canal is located on the northern side of the St. Lawrence River. It extends from the city of Montreal to the village of Lachine, and was constructed to overcome the St. Louis rapids. It is 8½ miles in length, has five locks, and a total lockage or rise of 45 feet. Its mean width is 150 feet. It consists of one channel, with two distinct systems of locks, the old and the enlarged. Its present navigable depth is 12 feet, but with the excavation of the canal prism to a further depth of 2 feet, it will accommodate vessels of 14 feet draft. A portion of this canal is lighted by electricity. Its construction consists of the excavation of earth and rock, and the manner of letting the work is by public tenders. The work on this canal was commenced in 1821, and the first vessel passed through it in 1825.

Beauharnois Canal.—This canal commences 15¼ miles west from the head of the Lachine Canal. It is on the south side of the St. Lawrence River and connects Lakes St. Louis and St. Francis, and passes the three rapids known, respectively, as the Cascades, the Cedars, and the Coteau. Its length is 11¼ miles, the number of locks is nine, and their dimensions are the old size—200 feet long and 45 feet in width. The total rise or lockage overcome is 82½ feet; the navigable depth is 9 feet; the breadth of the canal bottom is 80 feet, and its breadth at the water surface is 120 feet. Opened in October, 1845, for navigation.

Cornwall Canal.—The Cornwall Canal was commenced in 1834 and opened for navigation in 1842. It is situated on the north side of the St. Lawrence, opposite the village of Cornwall, and commences $32\frac{3}{4}$ miles from the head of the Beauharnois Canal. It extends past the Long Sault Rapide. It is the longest canal on the St. Lawrence, being $11\frac{1}{2}$ miles in length, has six locks, two of which are of the new or enlarged size. The total rise or lockage overcome is 48 feet. The navigable depth is 9 feet. Its breadth at the bottom is 100 feet and at the water surface 150 feet. Four new locks are under contract and are now [1889] in the actual course of construction, together with the supply weirs and bridges, also the enlarging and deepening of the canal prism. Its water is utilized for motive power by varied and extensive manufacturing industries. This canal was formed by excavation and crib work.

Williamsburg Canals.—The Farrans Point, Rapide Plat, and Galops canals are collectively known as the Williamsburg Canals. They are situated on the north shore of the St. Lawrence River and were constructed to overcome certain rapids, the names of which they bear. They were formed by cutting through projecting points, and with the material removed inclosing bays and indents in the shore line, making a continuous range of bank between the river and the canal. Wherever required by the swiftness of the current, the depth of water, or other circumstances, the bank is made solid by a line of rough crib work, and along the outer side of the bank as well as the two inner sides of the canal a wall of broken stone has been built to prevent the washing of the sides. The channel is 50 feet wide at the bottom, with side slope of 2 horizontal to 1 vertical. The breadth of the canal is 90 feet at the surface of the water and it is navigable for vessels of 9 feet draft.

The Farrans Point Canal is the first of the division in ascending the river. It commences 5 miles from the head of the Cornwall Canal. It was opened in 1847, is three-fourths of a mile in length, has one lock, with a lockage or total rise of 4 feet. Its banks vary from 15 to 38 feet high over the water surface.

Rapide Plat Canal is the second of the series and is located opposite the village of Morrisburg. It commences $10\frac{1}{2}$ miles from the head of Farrans Point Canal. It was first opened for navigation in September, 1847. It is 4 miles in length, has two locks, and a total rise or lockage of $11\frac{1}{2}$ feet. The enlargement of this canal in conformity with the proportions of the general scheme has been commenced.

The Galops Canal commences $4\frac{1}{2}$ miles from the head of Rapide Plat Canal. It is $7\frac{5}{8}$ miles in length, has three locks, and a total rise or lockage of $15\frac{3}{4}$ feet. It was first opened October, 1847. The new work completed on this canal consists of the deepening of a channel way at upper end, greatly facilitating access to the canal.

Welland Canal.—The Welland Canal connects Lake Erie with Lake Ontario. It is $26\frac{3}{4}$ miles in length, extending from Port Colborne to Port Dalhousie. It has twenty-six locks and a total rise or lockage of

326¾ feet. Its construction was commenced by an incorporated company. The first sod was turned November 30, 1824. The company's financial resources proved inadequate to the large outlay that was necessary to maintain the canal in the efficient condition its importance required, and in 1841 an act was passed authorizing its purchase by the Government. This canal was opened for navigation in 1841. It has gone through several subsequent changes, the tendency of which has been to greatly increase its depth and dimensions.

THE SAULT STE. MARIE CANAL.

A press dispatch from Sault Ste. Marie, Ontario, gives the following account of the opening, on the 13th of June, 1895, of the Sault Ste. Marie Canal, connecting the waters of Lake Superior with those of Lake Huron by a route on the Canadian side, avoiding the rapids of the strait:

It was expected that a large delegation of ministers and members of the Canadian Parliament would be here to-day to join in celebrating the opening of the new Canadian canal, but as members in both sides of the house were opposed to breaking in on the time of Parliament when so many were anxious to get home, the idea was abandoned.

There were no speeches or parades or other ceremonies incident to the opening. The canal will not have an available draft at present of more than 14 feet on account of bowlders in the channel. It will take a month yet to remove all obstructions.

The contracts for the canal and lift locks were let in November, 1888, and those for the entrance works in January, 1889. Water was first admitted to the lock September 25, 1894. The total length of the canal across St. Marys Island is 4,000 feet, or from eastern to western extremities of the piers about 8,000 feet. With the approaches, the total distance is about 3½ miles. The lock chamber is 900 feet long, 60 feet wide, with depth of water sufficient to pass vessels of 20 feet draft at the lowest recorded stage of water below the lock. The lock fills in nine minutes and can be emptied in seven and one-half minutes.

The canal proper has a surface width at low-water level of 152 feet, and a bottom width of 145 feet. At a point about 1,500 feet above the lock it is crossed by a swing-bridge over which the railway systems of Canada and the United States find accommodation. The works altogether cost about $4,000,000.

The New York Journal of Commerce of June 17, 1895, says:

On Thursday the Canadian canal at the falls of St. Marys River, the outlet of Lake Superior, was opened, and it affords to navigation much greater facilities than the canal on the American side which is now in use, but the American canal which will be opened next year will in its turn surpass the Canadian canal in general capacity, though the Canadian canal will remain superior in two dimensions. These canals and their locks may be spoken of interchangeably, because in each case the canal consists simply in the lock and the channels approaching it. It is only fourteen years since the present American canal was opened, and yet the growth of the lake commerce was so rapid that the construction of a new lock was begun six years ago. The inadequacy of the lock now in use became apparent before it was opened for commerce, but when it was projected a lock 515 feet long and carrying 17 feet of water on the sills in a favorable stage of water seemed likely to respond to all demands upon it for many years to come.

The Canadian lock, which in rapidity of construction has outstripped ours, is 900 feet long, 60 feet wide and 22 feet deep. Of our new lock, the masonry work is completed, and all the gates will be completed this summer, but nearly a year's work

remains on the approaches. The lock is 800 feet long, 100 feet wide, and a steamer drawing 21 feet of water can pass through it. Though shorter than the Canadian lock, its superficial area is 80,000 feet, and that of the Canadian canal 54,000 feet. The American canal lock will accommodate four of the largest lake steamers at the same time. The depth of the lock is as great as there will be any occasion for until the lake ports generally are deepened. The two largest and finest passenger steamers on the lakes, the *Northwest*, which was put on the route last year, and the *North Land*, which has begun her career this year, and which compare not unfavorably with Atlantic passenger steamers, excepting a very few of the champion racers, draw, we believe, but 17 feet of water. It seems unlikely at present that steamers drawing more than 21 feet will ever be desired on the lakes.

The net registered tonnage passing through the St. Marys Falls Canal in 1885 was but a trifle more than 3,000,000 tons, and the average tonnage of vessels was 602 tons; in 1894, in spite of the dullness in the ore trade in the early part of the year, the tonnage of the canal exceeded 13,000,000 tons, and the average tonnage of vessels passing through had increased to 944 tons. The net tonnage that passed through the Suez Canal in 1894 was but a trifle over 8,000,000 tons. The number of passengers carried through the St. Marys Canal in 1894 was 14,491, compared with 3,352 through the Suez Canal. The aggregate tonnage of all domestic and foreign steam and sailing vessels that entered from or cleared for foreign countries at all ports of the United States in 1894 was only a little more than 15,000,000 tons, or a little more than 2,000,000 tons in excess of the tonnage of vessels that passed through the lock of the St. Marys Canal.

UNITED STATES AND CANADIAN CANAL COMMISSION.

In the sundry civil appropriation bill, the Fifty-third Congress, third session, 1895, provided that the President of the United States be authorized to appoint three persons who should have the power "to meet and confer with any similar committee which may be appointed by the Government of Great Britain or of the Dominion of Canada, and who shall make inquiry and report whether it is feasible to build such canals as shall enable vessels engaged in ocean commerce to pass to and fro between the Great Lakes and the Atlantic Ocean, with an adequate and controllable supply of water for continual use; where such canals can be most conveniently located, the probable cost of the same, with estimates in detail; and if any part of the same should be built in the territory of Canada, what regulations or treaty arrangements will be necessary between the United States and Great Britain to preserve the free use of such canal to the people of this country at all times; and all necessary facts and considerations relating to the construction and future use of deep water channels between the Great Lakes and the Atlantic Ocean." Writing of this project from Ottawa, under date of June 11, 1895, a correspondent of the New York Evening Post says:

> The Dominion Government is about to appoint a departmental commission for the same purpose, and it is expected that the two bodies will meet, and, if possible, arrive at a common plan. An international convention, held at Toronto last fall, recommended that the route should be deepened to 21 feet and a canal of the same depth constructed from the St. Lawrence to the Hudson, either by way of the Mohawk or by enlarging the existing channel of the Richelieu River and Champlain Canal, the whole work to be done at the joint expense of the United States and Canada

and to be subject to their joint control. This convention was the outcome of smaller conventions at Grand Forks and elsewhere in the Northwestern States.

Canada has spent about $50,000,000 on the St. Lawrence route to secure a 14-foot channel. From the Strait of Belle Isle to Duluth is 2,385 statute miles, of which 72 are artificial and 2,313 open navigation. From Belle Isle to Liverpool is 2,234 statute or 1,942 geographical miles. The artificial navigation can be deepened to 21 feet for about $30,000,000. The cost of enlarging the Richelieu and Champlain route to connect Montreal with Albany and New York City is not accurately known, nor has any estimate been formed of the cost of building a canal by the Mohawk. Some engineers recommend that instead of going by the Mohawk or the Richelieu it would be better to build a canal from Caughnawaga, opposite Montreal, to Lake Champlain. The entire project is still in the nebulous form, though all agree that it would be a great thing for the Northwest to have a deep-water line to New York and New England as well as to Liverpool.

The navigation of the Gulf of St. Lawrence was made free to both nations by the treaty of 1783, that of the River St. Lawrence by the Washington treaty of 1871. But the key to the navigation of the river lies in the Canadian canals between Montreal and Kingston, and between Lake Ontario and Lake Erie. The Welland Canal, joining these two lakes, is 14 feet deep and the lower canals will soon be that depth; at present their greatest depth is 9 feet. The fleet of large steamers, 300 in number, plying west of Buffalo, is thus literally shut up in the upper lakes; in other words, the St. Lawrence route to tidewater is available only to the smaller lake craft, and till a depth of 21 feet is obtained from end to end the cost of transportation can not be materially reduced.

The Dominion is not in a position to sink much more money in canals or anything else, its net debt being already $50 per head. Canadians think, moreover, that as the United States would profit fully as much as themselves from a 21-foot channel between Montreal and Duluth, the United States should help to foot the bill. It is said that with that depth in the canals wheat could be sent from Duluth to Liverpool for 10 cents a bushel. But the principal gain, perhaps, would be in the cheapening of transportation between the Northwestern and Eastern States, food products going one way and manufactures the other. It is also assumed that the low rates on this route, open seven months in the year, would tend to reduce rates on all lines of railroad south of it connecting the Western States with the Atlantic. The distance from Montreal to New York by the Richelieu River and Champlain Canal is 457 miles, of which 372 are open and 85 artificial navigation. The lockage upward from the St. Lawrence at Sorel to the summit-level of the Champlain Canal is 136 feet, and from the summit down to Albany 150 feet. Mr. L. E. Cooley, the Chicago engineer, advocates a 21-foot channel from Chicago to the Gulf of Mexico as part and parcel of the St. Lawrence scheme.

BRITISH COLUMBIA.

OCEAN LINES.

Victoria, British Columbia, from its location and its natural relation to coastwise and transpacific lines, is a growing center of travel and traffic, and of necessity, will always remain so. It lies directly in the way of all the north and south Pacific Coast lines, both rail and water, and of all the lines from the Orient which strike the American continent north of San Francisco. It is the first and last port touched by

deep sea vessels coming and going from all that part of the globe where extreme west meets extreme east.

Six principal steamship lines touch at this port at present, or make it one of their termini. The great through lines of traffic are: Canadian Pacific Steamship Company, Canadian and Australian Steamship Company, Northern Pacific Steamship Company, Pacific Coast Steamship Company, Puget Sound and Alaska Steamship Company, Canadian Pacific Navigation Company. In addition to these lines are the Esquimalt and Nanaimo Railway; the steamship line from Victoria to Comox, and the line to New Westminster and other points on the Fraser River.

Canadian Pacific Navigation Company Line.—The vessels of this line are the *Empress of China*, the *Empress of India*, and the *Empress of Japan*. They run in connection with the Canadian Pacific Railway, making Vancouver the American terminus, and Hongkong the Asiatic terminus. These ships are of about 6,000 tons register, 10,000 horsepower, 485 feet long, 51 beam, 36 below hatches, and are fitted for both passengers and freight. They are new, having been built at Barrow, England, in 1891; are in excellent condition, and can accommodate 180 first class, 200 second class, and 1,000 steerage passengers. The ocean is crossed in thirteen to fourteen days, and trips are made once in three weeks.

The distance from Vancouver to Yokohama is 4,283 miles; fare (first class), one way, $200; round trip, $300.

Distance from Vancouver to Hongkong, 6,140 miles; fare (first class), one way, $225; round trip, $325.

Freights are difficult to quote, owing to classification, quality, etc. They run from $5 to $50 per ton, through rates.

Canadian and Australian Line.—This line was opened in 1893, the first trip being made by the *Miowera*, since then disabled and returned to England for repairs. The vessels now in service are the *Warrimoo* and *Arawa*. They are of 5,000 tons register, thoroughly seaworthy, of good power, and well fitted for both passenger and freight business. The terminal points are Vancouver and Sydney, touching at Honolulu and Suva en route. The distances are: Vancouver to Honolulu, 2,410 miles; Vancouver to Sydney, 6,824 miles. Fare to Honolulu (first class), $75; to Suva or Sydney, $200. The steamers stop at Victoria going and coming, landing at the outer wharf. They also make stops of several hours at Honolulu and Suva. Through freight rates run from $5 to $20 per ton, according to classification.

Northern Pacific Steamship Company.—This line was opened in 1893 and runs in connection with the Northern Pacific Railroad. There are three vessels, the *Tacoma*, the *Victoria*, and the *Sikh*. The terminal points are Tacoma, Washington, and Hongkong, China. Service in summer once in three weeks, and in winter once in four weeks. The

Tacoma is a vessel of 1,662 tons; length, 327 feet; beam, 39; below hatches, 26; horsepower, 250; compound engines; the *Victoria*, 2,035 tons; length, 360 feet; beam, 40; below hatches, 34; horsepower, 500; the *Sikh*, 1,736 tons; length, 335 feet; beam, 40; below hatches, 25; horsepower, 500. First-class passenger rates from Tacoma to Yokohama, $175; from Tacoma to Hongkong, $225. Freight rates may be quoted at $12 per ton, but they vary much under classification. The vessels are in good condition and make the passage in fifteen to eighteen days.

COASTWISE LINES.

Pacific Coast Steamship Company.—This line has been in business for many years between San Francisco (where it connects with the transcontinental railroads) and Puget Sound ports. It also runs steamers the year round from Puget Sound to Wrangel, Juneau, and Sitka, Alaska. In summer extra vessels are put on this northern service that carry excursion parties to that far-off, interesting region. The steamers from San Francisco come directly to Victoria, British Columbia, without touching at intermediate points. After landing passengers and freight at Victoria they spend several days in the Sound, visiting Port Townsend, Seattle, Tacoma, Fairhaven, and occasionally other ports, returning to Victoria before leaving on the homeward bound trip. The distance from San Francisco to Victoria is 750 miles. The vessels are the *Umatilla*, *Walla Walla*, and the *City of Puebla*.

The two former are of 3,070 tons register, iron, screw propellers; length, 310 feet; beam, 40; hold, 22. The *City of Puebla* is somewhat smaller. All are kept in complete repair and are skillfully and safely handled by competent officers. Fare between termini, first class, $20, including berth and meals; second class, $10. Freight charges range from $2.50 to $6 per ton.

The line to Sitka is made up of the *City of Topeka*, which runs the year round, and the *Queen*. Service monthly. The *City of Topeka* is of iron, screw propeller, 1,057 tons; length, 198 feet; beam, 35; depth, 18. The *Queen* is of 2,728 tons; length, 332 feet; beam, 38; hold, 12½. Fare to Wrangel, $50; Juneau, $70; Sitka, $70.

Canadian Pacific Navigation Company.—This company operates regular lines to Vancouver, British Columbia, to connect with the Canadian Pacific Railway, and to New Westminster and points farther up the Fraser River; also, a northern line to Fort Simpson, Skeena River, Bella Bella, Alert Bay, and Queen Charlotte Islands; also, to Barclay Sound and Alberni on the west coast of Vancouver Island. It owns eight steamers, among them the *Islander*, the *Premier*, the *Danube*, the *Rithet*, and the *Princess Louise*. The *Islander* is an iron vessel, double screw, 864 tons, and usually makes the run to Vancouver daily, 80 miles; fare, $5. Distance to New Westminster, 75 miles, the *Premier* making the round trip three times a week. She is a screw, wooden

vessel of 498 tons. The *Danube*, an iron, screw vessel, 581 tons, has the northern run. Distance to Metlakahtla and Fort Simpson, 527 miles; fare, first class, $20; second class, $10. Trips to Barclay Sound and Alberni are made every fortnight; distance to Cape Beale, 95 miles; fare, $5; to Alberni, 129 miles; fare, $7.

Puget Sound and Alaska Steamship Company.—The boats of this line are the *City of Kingston*, of iron, screw, fitted for freight and passengers, 816 tons; and the *City of Seattle*, of wood, screw, 913 tons. One or the other of these boats make six round trips a week between Tacoma, where they connect with the Northern Pacific Railroad, and Victoria, British Columbia; distance, 114 miles, touching at Port Townsend and Seattle en route. Fare from Victoria to Port Townsend, $2; to Seattle, $3; to Tacoma, $3.50. Freight charges on general merchandise, $3 per ton. These steamers are in first-class condition, and are palatial and their passenger accommodations good.

The Comax Line.—The steamer *Joan*, a wooden propeller of about 400 tons, new and neat, makes weekly trips from Victoria to Comax, and sometimes extending it to Valdez Island and Seymour Narrows. She runs in connection with the Esquimalt and Nanaimo Railroad, being owned and operated by the same interests. The trips to Comax are continued the year round; to other points in summer only. The ride is a delightful one, constantly among islands and narrow passages, with towering rocky shores on either hand. Numerous landings are made at mills, farms, and hamlets. Distance from Victoria to Comax, 130 miles; fare, $9, exclusive of meals and berths; to Valdez Island and the Narrows, $12.

RAILWAYS.

Esquimalt and Nanaimo Railway.—This line, starting at Victoria, runs northwest of Vancouver Island to Nanaimo, 73 miles, and to the Wellington mines, 5 miles farther. Fare to Nanaimo, $3; to Wellington, $3.25. Return tickets good for seven days, at one and one-half fare. Excursion rates, one and one-fourth fare, Fridays, Saturdays, and Sundays. The track lies in a mountainous region, and rises to 1,000 feet above Saanich Arm, which it skirts for several miles. The scenery is delightful. Niagara Canyon is spanned by a trestle of 200 feet in height, and Arbutus and Double Head ravines by trestles of 150 feet each. Shawnigan Lake, 28 miles from Victoria, is a beautiful expanse of water and affords fine trout fishing. Freight rates, car lots, to Nanaimo, $15. Excursionists to Alaska, when the vessel arrives at Victoria, frequently take this line to Nanaimo, joining the vessel again when it arrives at that point. They also frequently take the cars at Naniamo, coming down, and await the arrival of the vessel at Victoria.

All these lines are operated by corporations.

HIGHWAYS.

The natural surface of the country is so rough and so obstructed by forest trees and underbrush that carefully constructed highways are a necessity of occupancy by civilized men. Good roads, therefore, abound. They are constructed by skilled engineers, and are paid for out of the general treasury. First-class roads cost from $2,000 to $4,000 per mile, and there are 1,250 miles in the province of British Columbia. Second-class roads cost $500 to $1,000 per mile. The drives in the vicinity of Victoria are noted for their excellence.

LEVI W. MYERS,
Consul.

VICTORIA, BRITISH COLUMBIA, *May 12, 1894.*

MANITOBA.

RAILWAYS.

The Northern Pacific Railway.—This railroad is controlled by a corporation of that name. At present it is in the hands of receivers. The principal termini are: In the East, St. Paul and Minneapolis, Duluth, and Superior; on the Pacific Coast, Portland, Tacoma, and Seattle. In addition to the above points, it reaches Winnipeg, Brandon, and Portage La Prairie, in Manitoba, and the following intermediate points on its main line: Fargo, Jamestown, Mandan, Yellowstone Park, Helena, Butte, Spokane, Ellensburg, etc. Total mileage in operation, 4,657 miles. The principal offices are in St. Paul, and the mileage between St. Paul and the points named is as follows: Winnipeg, 482; Portland, 2,056; Seattle, 1,932; Spokane, 1,512; Tacoma, 1,912; Mandan, 450; Jamestown, 343; Helena, 1,130. The condition of the line is good; it is a single track line. The passenger and freight train service is daily. The passenger rates are various; in Manitoba it is 3 and 4 cents per mile. The freight rates vary according to distance and classifications; for instance, taking a distance of 10 miles, first-class rates are 15 cents per 100 pounds, and tenth class, or lowest grade, 5 cents. The other classes are graduated between. A large amount of traffic is brought through from eastern Canadian and American ports; also from Great Britain and the Pacific Coast, as well as from Asiatic points.

Canadian Pacific Railway.—The mileage of all the Canadian Pacific Railway lines is 6,015.5 miles. The total mileage of the western division of this road, which is operated from this city (Winnipeg), is 2,953.8. Of this, 1,449 miles is main line, extending from Port Arthur, Ontario, to Donald, British Columbia, and the whole of it, except 61 miles, is east of the British Columbia boundary. The Qu'Appelle, Long Lake

and Saskatchewan Railway, from Regina to Prince Albert, and the Calgary and Edmonton Railway, from Calgary to Edmonton and Calgary to Macleod, are operated by this company under lease, but in the meantime, they are, to all intents and purposes, parts of the Canadian Pacific Railway.

All the lines in this district forming a part of this system are operated by railway companies, the Government having no interest therein.

The termini of the Canadian Pacific Railway are St. John, New Brunswick, on the Atlantic coast, Quebec, on the St. Lawrence River. Vancouver, on the Pacific coast, and Windsor, on the Detroit River, This is without mentioning branches, many of which reach the international boundary line between Canada and the United States, where goods and passengers may easily be transferred to and from connecting American lines. This company built an important line in 1893 from North Portal, on the boundary line between North Dakota and Assiniboia, to Pasqua, the first station east of Moose Jaw, on the main line, 161 miles. This new line is built according to the highest standard, with heavy steel rails and some of the longest tangents in existence. The importance of this line rests in the fact that in connection with the main line of the Canadian Pacific Railway and the Minneapolis, St. Paul and Sault Ste. Marie Railway it forms the shortest line from St. Paul to the Pacific Coast at Vancouver. The condition of this company's lines is first class in every respect.

All railways in this country are single-track lines; gauge, 4 feet 8½ inches.

On the main line west of Winnipeg, the service is daily; east of Winnipeg it is six days a week, there being no train arriving at or leaving Montreal on Sunday.

The average freight rate per ton per mile on the Canadian Pacific Railway during the year 1893 was 0.87 cent. The average rate per passenger per mile was 1.69 cents. The local rate on this division is 3 cents per mile on the main line between Fort William (Lake Superior) and Brandon, Manitoba. West of Brandon and on the branches the rate is 4 cents per mile. I do not know that on this division and within this consular district there are any very important bridges. The bridge over the Red River of the North at Winnipeg is a masonry and iron bridge, 691 feet long, and was constructed by the city of Winnipeg, and is used by this company under an agreement. The company also has a masonry and iron bridge over the Saskatchewan River at Saskatoon, and there are various crossings of the Assiniboine River in Manitoba, the Bow River in Alberta, and the Kicking Horse River in British Columbia.

The equipment of the Canadian Pacific Railway Company consists of 578 locomotives, 891 passenger coaches, 14,802 freight cars, 522 boarding, tool, auxiliary cars, steam shovels, etc.; 3 steel steamships

on Lake Superior—the *Alberta*, *Athabasca*, and *Manitoba*—and 3 steamships on the Pacific Ocean—*Empress of China*, *Empress of Japan*, and *Empress of India*.

The main line of this road crosses the main chain of the Rocky Mountains at the British Columbia boundary at an elevation of 5,299 feet above the level of the sea.

I have not been enabled so far to report on the Great Northern Railway.

M. M. DUFFIE,
Consul.

WINNIPEG, *June 29, 1894.*

ONTARIO.

RAILWAYS.

The Canadian Pacific and the Canada Atlantic are the only through lines of railway touching Ottawa. The Grand Trunk Railway secures entrance to the city by arrangement with the Canada Atlantic, using its track from Coteau, 78 miles from Ottawa.

Canadian Pacific Railway.—The Canadian Pacific Railway Company was organized in 1881 to construct a road across the continent. Prior to that time, the Canadian Government had commenced the construction of such a line. In 1881, it made an arrangement with the Canadian Pacific Company to build the road, and in aid of the enterprise gave 413 miles of road which it had constructed between Lake Superior and Winnipeg, and 213 miles between Burrards Island, on the Pacific, and Kamloops Lake, British Columbia. The cost of the lines thus ceded, and other improvements transferred to the company at the same time, amounted in the aggregate to $37,527,995. In addition to these, a subsidy or bonus of $25,000,000 was made, besides a grant of 26,586,000 acres of agricultural land. The company now owns 5,766 miles of railway, with termini at Quebec and St. John, New Brunswick, in the east, and Detroit, St. Paul, Duluth, and Vancouver, in the west. The distances in miles from Quebec are: To Vancouver, 3,078; to Detroit, 744; to Duluth, 1,212; to St. Paul, 1,305; to Montreal, 176; to Ottawa, 296; to Winnipeg, 1,421. It is a single-track road, first-class construction and equipment, and runs through passenger trains daily. The local rate is 3 cents per mile. Through return tickets are sold at about one-half this rate. The rates for freight depend upon the length of haul and class of goods.

The company also have three first-class steamers plying between Vancouver and China and Japan. It also has a line of steamers on the Great Lakes, between Owen Sound and Fort William, touching at Sault Ste. Marie en route.

Canada Atlantic Railway.—The construction of this line was commenced in 1881. When completed, it will connect the Vermont Central and Delaware and Hudson River systems at Rouses Point with Parry Sound on Lake Huron, and will furnish the shortest rail and water route from Chicago, Milwaukee, Duluth, and other lake ports to Boston, Portland, and other New England points. The road is completed from Ottawa to Rouses Point, 135 miles east, and to Long Lake, 140 miles west of Ottawa. The company expects to finish the line next year. It is a single-track road, thoroughly built and equipped. It connects with the main line of the Grand Trunk Railway at Coteau, 50 miles west of Montreal. The company bridged the St. Lawrence at this point at a cost of $1,200,000.

The road carries the larger part of the lumber from the Ottawa Valley to New York and the New England States. West of Ottawa, the road runs through the Algonquin Park, a large tract of primeval forest set apart by the Province of Ontario. This region is regarded as the best fishing and hunting ground in Canada. The rates charged for passengers and freight are about the same as charged by the Canadian Pacific Company.

THE RIDEAU CANAL.

The Ottawa River and Lake Ontario are connected by the Rideau Canal, the termini being Ottawa and Kingston, the distance between the cities being 126 miles. The canal was constructed by converting the Rideau and Cataraqui rivers into a continuous navigable channel. There are forty-seven locks. The depth of water on the lock sills is 5 feet. The locks are 134 by 33 feet. The canal was constructed for military purposes by the British Government between 1826 and 1832, at a cost of $3,911,701, and was transferred to the Canadian authorities in 1857. With the completion of this work, access by water to the Great Lakes from the St. Lawrence at Montreal was had via the Ottawa River and this canal, the whole distance from Montreal to Kingston being 246 miles. The completion of the St. Lawrence canal system has rendered it useless for that purpose, but lumber and other products originating in the Ottawa Valley are shipped to New York via the Ottawa River to Montreal, thence down the St. Lawrence River to Sorel, 45 miles east of Montreal, thence by the Richelieu River to Lake Champlain, through Lake Champlain and the Champlain Canal to the Hudson River at Troy. Shipments from the Ottawa Valley are made to Lake Ontario ports via the Rideau Canal.

JOHN B. RILEY,
Consul-General.

OTTAWA, *September 20, 1894.*

NEW BRUNSWICK.

The natural situation of St. John, possessing the only harbor of easy access upon the northerly side of the Bay of Fundy, and its connection with the interior by the broad, navigable River St. John, render it the natural point of distribution for New Brunswick. These causes have made it the terminus of the principal railway systems of the Province.

OCEAN LINES.

Furness Line.—The Furness Line plies between this port and London, touching at Halifax, and has four steamers, of 1,400 tons each, making fortnightly trips. The vessels are fitted for freight and passengers, are well equipped, and in good condition.

West India Line.—The West India Steamship Line makes monthly trips between St. John and Demerara, employing two steamships, of 1,180 tons each, and touching at Bermuda and various of the West India Islands. These steamships are primarily intended for the carriage of freight, but afford comfortable accommodation for passenger traffic.

COAST LINES.

International Steamship Company.—The larger portion of summer traffic, both in passengers and freight, is carried by the International Steamship Company. This is an American line, of which the principal offices are at Boston, Mass., and Portland, Me., and was established some forty years ago.

This line has at present three steamers, of 868, 1,145, and 1,188 tons, respectively, making daily trips between Boston and St. John during the summer, and semiweekly trips at other times. Its steamers touch at Portland, Eastport, and Lubec, Me. Another boat, now in process of construction at Bath, will be placed on the route upon its completion in the early fall.

In behalf of this line, the well-founded claim is made that it is surpassed by no coastwise line of equal extent in the world in the character and equipment of its boats and the personnel of its officers and crews, and its appreciation by travelers and tourists is attested by the constantly increasing volume of its business.

This route affords the most direct and comfortable means of reaching the various points of interest in the Maritime Provinces from the United States.

Bay of Fundy Company.—The Bay of Fundy Steamship Company uses a single steamer, of 478 tons, between St. John and Digby, Nova Scotia, and is a favorite route for tourists wishing to visit the Annapolis Valley and "Land of Evangeline." It is a daily summer line—semiweekly in winter—and is excellently well fitted to insure the comfort and convenience of travelers.

A single steamer of small tonnage plies weekly between this port and the Island of Grand Manan, and is the only regular means of reaching that resort. It touches at Eastport and Campobello.

All the foregoing lines, except the International, which is owned and operated by Americans, are heavily subsidized by the Dominion Government.

NAVIGABLE RIVERS.

The St. John River is navigable for some 90 miles, and two small steamers run between St. John and Fredericton, the capital, during the summer months, affording a most delightful excursion for tourists through the fertile valley of this river.

RAILWAYS.

The principal railway lines of the Province center at this port.

The Atlantic division of the Canadian Pacific runs from St. John along the banks of the river to Edmonton, at the extreme northern point of Maine, thence connecting with its western division. It also runs directly through the State of Maine, connecting at the frontier, at Vanceboro, with the Maine Central system, making the through rail route from the United States. It has a branch running to Fredericton, the capital. It is excellently ballasted and equipped.

The Intercolonial Railway, the building of which was a condition upon which the Maritime Provinces joined the confederation and was provided for in the act of union, extends from St. John to Moncton; thence southerly through Nova Scotia to Halifax and Sydney, and northerly by the Bay of Chaleur beyond the northern extremity of Maine to Quebec. It is wholly owned and operated by the Dominion Government, and is a well-conducted railway in respect to its equipment, roadbed and general management. Over these roads two passenger trains are run daily.

The Shore Line Railway runs between St. John and St. Stephen, on the St. Croix River. It is expected that a connection will be made between the terminus at the Maine frontier and the Maine Central. Until this is done the road is useful only for purely local traffic and is not available for the carriage of through business.

All the railways of the Province are operated over a single track.

HIGHWAYS.

Concerning the highways, no special mention seems necessary, as they possess no particularly noteworthy features, except, perhaps, the general excellence of the bridges, which are constructed at the expense and under the control of the Government. It is doubtful, however, whether such construction is as economical as the municipal performance of like work would be.

PASSENGER AND FREIGHT RATES.

The accompanying table gives as nearly as I am able to ascertain, the rates upon the various steamship and railway lines. Freight charges greatly differ between long and short hauls, and depend upon the amount of traffic and the extent of competition by water and otherwise; so much so, indeed, that no satisfactory schedule of rates could be obtained of officials. There are also discriminating rates given upon the roads owned by the Government in favor of the produce of the northern and western Provinces.

Names.	Ownership, etc.	Termini.	Length.	Rates.	
				Passenger.	Freight.
OCEAN LINES.			*Miles.*		
International Steamship Co.	Private corporation, American.	St. John and Boston.	.....	$5 to Boston....	12½, 15, 20 cents per 100 pounds to Boston.
Furness Line.....	Private corporations heavily subsidized by the Dominion Government.	St. John and London.	.....	$50 to London...	Depends largely upon contract.
West India Steamship Co.		St. John and Demerara.	.....	$110 to Demerara.	
Bay of Fundy Steamship Co.		St. John and Digby, Nova Scotia.	30	$1.75 to Digby..	
Grand Menan Line.		St. John and Grand Menan.	90	$2 to Grand Menan.	
RAILWAYS.					
Canadian Pacific Railway, Atlantic division.	Corporation, aided by Government.	St. John and Edmonton.	310	3½ cents per mile.	½ cent per ton per mile.
Intercolonial Railway.	Owned by Dominion Government.	St. John and Halifax and Sydney.	1,060	3 cents per mile length.	Greatly varies.
Shore Line Railway.	Private corporation.	St. John and St. Stephen.	80	.....	

JOHN S. DERBY,
Consul.

ST. JOHN, NEW BRUNSWICK, *February 15, 1895.*

NOVA SCOTIA.

RAILWAYS.

The Government of Canada controls the Intercolonial Railway, and the Windsor and Annapolis Railway is controlled by the company.

The termini and main points reached by the Intercolonial Railway are Halifax, Sydney, Pictou, St. John, and Quebec; and by the Windsor and Annapolis Railway, Halifax, Annapolis, and ultimately Yarmouth The length of the Intercolonial Railway is about 1,135 miles, and the distances from Halifax are: Sydney, 276 miles; Pictou, 117 miles; St. John, 275 miles; Quebec, 674 miles. The distance from Halifax to Annapolis (on the Windsor and Annapolis road) is 116 miles.

European mail and freight steamships connect at Halifax by several lines of steamers of various sizes.

The roads are single track. Trains run daily each way to terminals; to intermediate points more frequently.

Local rates for passengers, 3 cents per mile; through and excursion rates less. Freight rates, according to classification, distance, and quantity.

Highways or turnpike roads are about 60 feet wide.

GEORGE HILL,
Vice Consul-General.[1]

HALIFAX, *May 9, 1894.*

NEWFOUNDLAND.

The steamship lines between the United States and St. Johns are the Allan Line, from Baltimore and Philadelphia, calling at this port on its way to Glasgow, and receiving a subsidy from the Newfo undland Government for conveying mails from Great Britain, Halifax, and the United States to this port, and the Red Cross Line, which runs from New York to this port via Halifax. Both lines carry mails, and passengers when offered, and are owned by English companies. The rate of passage is from $25 to $40 to Baltimore; $20 to $30 to New York. Freight is 40 to 50 cents per barrel. Railroad communications across the country are not yet completed.

THOS. N. MOLLOY,
Consul.

ST. JOHNS, NEWFOUNDLAND, *March 5, 1895.*

PRINCE EDWARD ISLAND.

OCEAN LINES.

The ocean lines having Charlottetown as one of their termini, or as one of their ports of call, are the Canada Atlantic and Plant Steamship Line, Black Diamond Steamship Company, Quebec Steamship Company, Pickford & Black Line, and Dobell Line

The termini of the Canada Atlantic and Plant Steamship Line are Boston, Mass., and Charlottetown. The distance between Boston and Charlottetown is 612 miles. There is but one steamer on the line, viz, the *Florida*. She is in good condition and well adapted, both as to

---

[1] Vice Consul-General Hill omits to state that the Allan Line and the Red Cross Line of British steamers, as mentioned in the report from St. Johns, Newfoundland, call at Halifax.

freight and passenger traffic, to the requirements of the route. This is the *Florida's* first season to ply between these ports, and she has been specially fitted up to perform her work. She has a gross of 1,787 and a net of 1,307 tons. She makes weekly trips between this port and Boston. The passenger rate (first class) for the round trip is $7.50. The freight rates are: From Boston to Charlottetown—fruit, 10 cents per cubic foot; flour, 17 cents per barrel; tobacco, hardware, and manufactured cotton goods, 20 cents per 100 pounds. From Charlottetown to Boston—potatoes, 18 cents per 100 pounds; mackerel, 30 cents per barrel; lobsters, 8 cents per case; eggs, 20 cents per case; hides and pelts, 15 cents per 100 pounds; horses, $15. These are among the principal articles moving between both ports. Briefly stated, the rates charged by the line range from 6 to 10 cents per cubic foot, according to class, so that the freight upon any article not herein enumerated can be easily determined. The line is controlled by a corporation. The agents here are the Charlottetown Steam Navigation Company.

The termini of the Black Diamond Steamship Company are Montreal, and St. Johns, Newfoundland, with Charlottetown and Sydney, Cape Breton, as ports of call. There are two steamers on the line, viz, the *Bonavista* and *Coban*. The line is controlled by a corporation. The *Bonavista* has a gross of 1,306 and a net of 836 tons. The *Coban* has a gross of 1,063 and a net of 688 tons. The steamers are specially fitted for the passenger trade in the Gulf of St. Lawrence, having all the latest appointments and carrying experienced stewardesses. The passenger rates (first class) from Montreal are as follows: To Charlottetown, $18; to Sydney, $18; to St. Johns, $30. These rates include both meals and berth. The distance between Montreal and Charlottetown is 780 miles; between Charlottetown and Sydney, 217 miles; between Sydney and St. Johns, 360 miles. Fortnightly trips are made between Montreal and this port. The agents here are Peake Bros. & Co.

The termini of the Quebec Steamship Company are Montreal, and Pictou, Nova Scotia, with Quebec, Summerside, Prince Edward Island, and Charlottetown as ports of call. There is but one steamer, the *Miramichi*, on the route, and the controlling power is vested in a corporation. The *Miramichi* has a gross of 727 and a net of 491 tons. Her freight and passenger accommodation is good. The passenger rates (first class) are: From Montreal to Summerside, $24, and from Montreal to Charlottetown, $25. These rates include berth and meals. The distance from Montreal to Quebec is 180 miles; from Quebec to Summerside, 540 miles; from Summerside to Charlottetown, 40 miles. The *Miramichi* makes fortnightly trips between Montreal and Charlottetown. Her agents here are Carvell Bros.

The termini of the Pickford & Black Line are Halifax, Nova Scotia and Summerside, Prince Edward Island, with harbors along the eastern coast of Nova Scotia, Arichat, Cape Breton, and Charlottetown as

ports of call. The steamer on the route is the *Fastnet*. She has a gross of 337 and a net of 155 tons, and is owned by a corporation. Although designed chiefly for the freight requirements of the route, she has capital passenger accommodation. The rates (first class) from Halifax to Charlottetown, to and from Halifax to Summerside and return, are $7 and $7.50 respectively. Halifax is 257 miles from Charlottetown and 297 miles from Summerside. Weekly trips are made between all three ports. The agent here is W. W. Clarke.

The termini of the Dobell Line are Montreal, and St. Johns, Newfoundland, with Summerside and Charlottetown as ports of call. The steamship on the line is the *Polino*. She has a gross of 807 and a net of 524 tons. A corporation controls the line. The accommodation is almost exclusively for freight, and communication between the points mentioned depends, in a great measure, upon the quantity of freight offering. The agents here are N. B. & M. Rattenbury.

Traffic between the Magdalen Islands (situated about 50 miles north of Prince Edward Island) and the last named place is kept up by the steamer *St. Olaf*, which leaves Souris, Prince Edward Island, every week. She has a gross of 305 and a net of 72 tons. Accommodations for passengers are also provided. The distance between Souris and the Magdalen Islands is 60 miles.

COAST LINES.

Connecting Prince Edward Island with the mainland are two steamers, both owned by the Charlottetown Steam Navigation Company. These steamers make daily connections with the railway systems in Nova Scotia and New Brunswick. The *St. Lawrence* plies between Charlottetown and Pictou, Nova Scotia, the distance between the points being 45 miles. She is a side-wheel vessel of 846 tons gross and 675 tons net, and has good accommodation for freight and passengers.

The *Northumberland*, a steel, twin-screw steamer of 1,255 tons gross and 519 tons net, runs between Summerside and Point du Chene, New Brunswick. Summerside is distant from Charlottetown 49 miles. An express train on the Prince Edward Island Railway makes daily connections between both points, enabling passengers to catch the *Northumberland* at the former. The distance between Summerside and Point du Chene is 35 miles. The *Northumberland* is palatial in her appointments, and of admirable seagoing qualities.

RAILWAYS.

But one railway line traverses the Province of Prince Edward Island, viz, The Prince Edward Island Railway. It is a Government work, being owned and controlled by the government of Canada. Its track, a narrow gauge one, is 213 miles in length, and traverses the island from east to west. The termini are Charlottetown, Georgetown, and Souris in the east, and Tignish and Cape Traverse in the west.

MEXICO

MAP
of the
Railroads, Principal Rivers, Ports,
and
Steamship Lines,
in
MEXICO.

Railroads
Principal Rivers
SCALE
1
6. 000 000
A MILIMETER EQUAL TO 6 KILOMETERS
50 0 100 200 300 400 Kilometers

THE NORRIS PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.

Between this latter point and Cape Tormentine, New Brunswick, the winter ice-boat service across the Northumberland Strait is kept up. Trains runs daily over the whole line.

After leaving this Province and arriving in the neighboring Provinces of New Brunswick and Nova Scotia, passengers can reach the United States over the Intercolonial Railway or the Canadian Pacific Railway, or by steamship routes from St. John and Halifax.

DOMINIC J. KANE,
Consul.

CHARLOTTETOWN, P. E. I., *January 1, 1894.*

MEXICO.

PHYSICAL FEATURES.

The physical condition of Mexico is entirely different from the region north of it. The configuration of the country and the character of the seasons make great navigable rivers impossible. It is only on the level of the coast that some few rivers admit of traffic by small craft, and that not exceeding 125 miles from the Gulf and 62 miles from the Pacific coast. The numerous peaks, whose altitudes are between 10,000 and 17,000 feet above the level of the sea, are sparingly snow clad, and the quantity of snow falling on them is insufficient for causing large volumes of water or large streams. On the central table-lands, there are a few lakes, the waters of which are utilized to a limited extent by the Indians for traffic in their small, crude canoes. Canals are impracticable, on account of the topography, excepting on the Gulf coast and the plains of the central States and of the northern frontier; but the greatest obstacle to interior navigation is the fact that in certain periods of the year, principally in the dry season, either by natural evaporation or by the careless use of the waters for irrigation, the springs decrease to such an extent as to render the streams insufficient to float the smallest boats. Sooner or later this waste of water will be remedied, as the authorities are vigilant in protecting and guarding every element that contributes to the advancement of Mexico. This lack of means for navigation might, to a certain extent, be remedied by canalization and drawing off the waters existing in natural basins in various parts of the Republic and diverting them at intervals in certain seasons of the year to the rivers or canals which are navigable to maintain constantly the required depth.

On account of the peculiar geological formation of the country it has been difficult for the rulers to build good highways. Axayacatl, King of Mexico from 1469 to 1481, was evidently aware that of all the needs of a prosperous country there are few more important than the establishment and maintenance of facilities of communication to link together

and promote relations among its people. Consequently he built several roads connecting the great Tenochtitlan with the neighboring towns of his numerous allies. Cortez and his followers, after conquering the Aztec Empire, discovered that Mexico, with an immense extent of territory and a large variety of race elements, should have better means of travel and transportation, and later on the viceroys and Franciscan friars initiated lengthy highways. Three centuries of Spanish domination, however, did not accomplish much in this direction. The exertions of President Diaz and his liberality toward railroad enterprises and steamship lines have been the chief factors in establishing means of communication throughout the Republic, accomplishing what none of his predecessors could do—that is, making this one of the most prosperous of the Spanish-American countries.

I. RAILWAYS.

The principal railways in Mexico are controlled by corporations, excepting the Tehuantepec, which is owned by the Mexican Government. All are single track, more than half of their number standard gauge, and their condition, with few exceptions, is first class.

The Mexican Railway.—This was the first railway constructed in the Republic. It was begun in 1857, and portions of the line were opened at different times. The Puebla branch was inaugurated in 1869; the main line was opened for its entire length in 1873, and the extension from Ometusco to Pachuca in December, 1890. It is broad gauge, and runs through the States of Vera Cruz, Puebla, Tlaxcala, Hidalgo, and Mexico. It starts from the city of Vera Cruz, runs through Cordova, Orizaba, Puebla, Tlaxcala, and Pachuca and terminates at the City of Mexico. The length of the main line, City of Mexico to Vera Cruz, is 264 miles; the Pachuca branch 28 miles, the Puebla branch 29 miles, and the Tlaxcala branch (animal traction), 5 miles. Trains from the City of Mexico for Vera Cruz leave daily at 7 a. m., arriving on the same day at 6.30 p. m. From Vera Cruz trains leave at 6 a. m., arriving at 6.40 p. m. Connections are made with such trains at Apizaco for Puebla and Tlaxcala, and at Ometusco for Pachuca. An accommodation train leaves the City of Mexico daily in the afternoon for Pachuca and Puebla.

Passenger (first class) rates from the City of Mexico to Pachuca are $2.96; to Puebla, $3.06; to Esperanza, $6.15; to Orizaba, $8.34; to Cordova, $9.56, and to Vera Cruz, $14.50. Baggage allowance, 37 pounds; on through tickets, 150 pounds.

Rate on freight from Vera Cruz to Mexico is $4\frac{1}{2}$ to $9\frac{1}{4}$ cents per kilometer (0.621376 of a mile) per ton of 1,000 kilograms (2,204 pounds), and from Mexico to Vera Cruz half these rates. This road and the Interoceanic, Mexican Central, National, and International have formed a pool, and on long hauls, such as from the United States and Europe, have fixed and combined rates.

The Mexican Railway connects in Mexico City with the Mexican Central and Mexican National for northern and western points, and with the Interoceanico Railroad for Morales; in Puebla, with the Mexican Southern for Oaxaca, Puerto Angel, and Tehuantepec, and with the Interoceanic for Ixucar Matamoras; in San Marcos, with the Nautla Railroad for San Juan de los Llanos; in Esperanza, with the Tehuantepec Railroad; in Cordova, with the Agricola Railroad for Motzorongo and Tuxtepec; and in Vera Cruz, with the Alvarado Railroad for Tlacotalpam, San Andres, Tuxtla, Cosamaloapan, and Playa Vicente, and with steamship lines for Mexican gulf ports, namely, Progreso, Campeche, Carmen, Frontera, Coatzacoalcos, Tuxpan, and Tampico, and for Havana, American, English, Spanish, French, and German ports.

The Mexican Central.—This important means of communication between Mexico and the United States was constructed by virtue of a concession granted by the Mexican Government in April, 1880, which has been amended and modified at various times permitting the company to build branch lines to Guadalajara, Tampico, and Guanajuato. Work was commenced in May, 1880, and carried on simultaneously at its northern and southern extremities, completing the main line sooner than was anticipated by both the Government and the public. The road was opened to regular passenger traffic on the 10th of April, 1884. The Guadalajara division was opened May 21, 1888, and the Tampico division was finished March 30, 1890, thereby bringing the line to the Gulf of Mexico at Tampico. The railway is broad gauge, and traverses the Federal District, the States of Mexico, Hidalgo, Queretaro, Guanajuato, Jalisco, Aguas Calientes, Zacatecas, Coahuila, Durango, and Chihuahua. It affords an outlet to the agricultural centers of San Juan del Rio, Penjamo, Silas, the extensive territory called El Bajio, and Lagos; to such manufacturing cities as Queretaro, Celaya, and Leon; to the rich mining districts of Pachuca, Zimapan, Guanajuato, Zacatecas Sombrerete, Sierra Mojada, and Chihuahua; to the cotton country in the valleys of the rivers Nazas and Conchos; and to the commercial centers of Mexico, Guadalajara, Aguas Calientes, San Luis Potosi, and Tampico.

The length of the main line, City of Mexico to El Paso, Tex., is 1,224 miles; of the San Luis Division (including Tampico branch) 415 miles; Guadalajara division, 161 miles; Pachuca branch, 93 miles; Guanajuato branch, Silao to Guanajuato, 16 miles, and San Blas division, 17 miles. Through trains, from Ciudad Juarez for the City of Mexico, leave daily at 5.15 p. m., arriving next day at Chihuahua at 7 a m.; at Jimenez at 1.15 p. m., and at Torreon at 6.45 p. m.; the second day, at 9 a. m. it reaches Zacatecas; at 12.15 a. m., Aguas Calientes; and Silao at 6 p. m., finally arriving at the City of Mexico at 7 a. m. on the third day. The train for Tampico leaves City of Mexico at 9 a. m., arriving at Aguas Calientes at 12.15 a. m.; leaves Aguas Calientes at 2.45 a. m., arriving at San Luis Potosi at 7.55 a. m., and at Tampico at 9.30 p. m.

The train from Tampico leaves at 6 a. m., arriving at San Luis Potosi at 7.20 p. m., same day, and at Aguas Calientes at 1.15 a. m., reaching City of Mexico on the second day at 6.30 p. m. From Silao a train leaves daily for Guanajuato upon arrival of through and accommodation trains either way. From Irapuato, a train leaves daily at 8.35 a. m., arriving same day at Guadalajara at 3.30 p. m.; leaving Guadalajara at 11.30 a. m., this train returns to Irapuato, arriving there at 6.20 p. m. A train for Pachuca leaves the City of Mexico daily at 9 a. m., transfers at Tula, arriving at 1 p. m. same day; returning from Pachuca at 2.30 p. m., it arrives at City of Mexico at 6.30 p. m.

The Mexican Central connects at El Paso with the Atchison, Topeka and Santa Fe; for all points northeast and west with the Texas and Pacific; with the Southern Pacific for points north and east; with Southern Pacific Company and the Atchison, Topeka and Santa Fe for points north and west in the United States; at Gallejo, with stage for Ascencion and Casa Grandes Corralitos; at Chihuahua, with stage for Cusihuiriachic, Guerrero, and Rosario; at Jimenez, with stage for Allende and Parral; at Escalon, with Mexican Northern Railway for Sierra Mojada; at Torreon, with the Mexican International for Durango, Monterey and Tampico via the Mexican Gulf Railway; at Fresnillo, with stage for Sombrerete; at Zacatecas, with Sullivan Construction Railway for Ojo Caliente, with tramway for Guadalupe, and with stage for Jerez; at San Luis Potosi, with the Mexican National for Catorce Mines, Saltillo, Monterey, and San Miguel Allende; at Tampico, with steamers for Galveston, New Orleans, Mobile, New York, and European ports; at Celaya, with Mexican National for points north and south of that road; at Negrete, La Barca, and La Piedad, with stage for Zamora; at Guadalajara, with stage for Mazatlan, Tepic Guzman, Ameca, and Zapotlan; at El Castillo, with tramway for the falls of Juanacatlan; at Atequiza, with stage for Lake Chapala; at the City of Mexico, with the Mexican Railway and Interoceanic for Puebla Cholula, Orizaba, Vera Cruz, Jalapa, Cuautla, Oaxaca via Mexican Southern, with the Hidalgo Railway for Tulaucingo; at Huachinango, with the Mexican National for Toluca, Morelia and Lake Patzcuaro, and with stage for Cuernavaca.

First-class passenger rates from El Paso are: To Chihuahua, $11.08; to Jimenez, $18.27; to Escalon, $20.53; to Torreon, $25.55; to Zacatecas, $48.59; to Guanajuato, $49.30; to Irapuato, $49.51; to Celaya, $51.38; to Queretaro, $52.79; to Tula, $57.86; to City of Mexico, $60.31; from Aguas Calientes to San Luis Potosi, $8.61, and to Tampico, $18.12; from Irapuato to Guadalajara, $10.61. From City of Mexico: To Pachuca, $2.96; to San Luis Potosi and return, $24; to Tampico and return, $45; to Guadalajara and return, $25. Baggage allowance, 33 pounds on local and 150 pounds on through tickets.

Rates of freight from El Paso to City of Mexico, and vice versa, are: Class A, $5\frac{1}{2}$ cents; class 1, $4\frac{1}{4}$ cents; class 2, 3 cents, and class 3, $2\frac{1}{5}$

cents, per ton (2,204 pounds) per kilometer (0.6214 mile.) Freight rates on local traffic from Tampico to San Luis Potosi are the same as those of the Mexican Railway from Vera Cruz to City of Mexico. For carload rates a rebate of 5 to 15 per cent is allowed the on above rates.

The Mexican National Railroad.—This road has no less importance than the Central, although it is a narrow gauge. It is the shortest route from the United States to Mexico. The through line was completed September, 1888, and was opened for traffic November 1, 1888. It unites the capital of the Republic with the States of Mexico, Michoacan, Guanajuato, San Luis Potosi, Coahuila, Nuevo Leon, and Tamaulipas. After ascending from the City of Mexico on its way west and north, this road touches Toluca, Maravateo, Acambaro, Morelia, Patzcuaro, Celaya, San Miguel, Allende, Dolores Hidalgo, San Luis Potosi, Vanegas, Saltillo, Monterey, Lampazos, and Laredo. The length of the main line, City of Mexico to Nuevo Laredo, is 840 miles; the Patzcuaro branch, Acambaro to Patzcuaro, 96 miles; Matamoras division, Matamoras (on the Rio Grande) to San Miguel, Tamaulipas, 75 miles; El Salto branch, City of Mexico to El Salto, 42 miles; and from Laredo, Tex., the road runs 161 miles east to the port of Corpus Christi.

Through trains from Laredo leave daily at 4.45 p. m., arriving at the City of Mexico on the third day at 8.55 a. m., making the trip in forty hours. From the City of Mexico it leaves daily at 5 p. m. for Laredo, arriving at 10.45 a. m. third day. An accommodation train leaves Laredo daily at 6.40 a. m., and reaches Monterey at 7.45 in the evening; leaves Monterey 6.35 a. m., and reaches Laredo at 6.50 p. m. same day. A train leaves Saltillo at 7 a. m. daily, and in a five hours run reaches Monterey; returning, leaves Monterey at 8.35 p. m., and reaches Saltillo at 3 a. m. next day. An express train leaves San Miguel daily, excepting Sundays, at 5.45 a. m., and arrives at the City of Mexico at 8.15 p. m. same day; going north, the same train leaves Mexico City at 6.30 a. m., and reaches San Miguel at 8.35 in the evening. Trains leave Acambaro daily, Sundays excepted, for Morelia at 4.30 p. m. and 7.45 a. m., arriving at 7.45 p. m. and 12.45 a. m., same day; this train continues on to Patzcuaro, arriving at 5.10 p. m.; returning, trains leave Patzcuaro at 6.30 and 10.20 a. m., reaching Morelia same day at 9.25 a. m. and 3.20 p. m. Trains run from Matamoras on Mondays, Wednesdays, and Fridays at 9 a. m., and reach San Miguel same day at 3 p. m.; leave San Miguel Tuesdays, Thursdays, and Saturdays at 10 a. m., arriving at Matamoras at 4 p. m. An accommodation train leaves the City of Mexico daily at 5.30 p. m., arriving at El Salto at 9.45 same evening; leaves El Salto at 5.30 a. m., arrives at the City of Mexico at 9.25 same morning.

The connections of the Mexican National are at Laredo, for points north and east in the United States; at Matamoras, with the Mexican Gulf Railway for Venadito, Montemorelos, and Tampico; at Vanegas, with Vanegas, Cedral and Rio Verde Railroad for Cedral and Mate-

huala; at San Luis Potosi, with Mexican Central for Aguas Calientes and Tampico; at Celaya, with same road for Guanajuato and Guadalajara; at Maravateo, with Michoacan and Pacific Railroad for Agangeo; at Toluca, with San Juan Railroad for Valle; at Mexico City, with the Hidalgo, the Interoceanic, and the Mexican for Pachuca, Puebla, Vera Cruz, Jalapa, Orizaba, and Cuautla Morelos.

First-class passenger rates from Laredo are as follows: To Monterey, $8.24; Saltillo, $11.54; Vanegas, $17.39; San Luis Potosi, $23.41; Celaya, $30.27; Acambaro, $32.53; Maravateo, $34.43; Toluca, $39.02; City of Mexico, $41.25. From Mexico City: To Toluca and return, $3; Maravateo, $6.83; Morelia and return, $15.50; Patzcuaro and return, $18; Celaya, $8.94; San Luis Potosi and return, $24; El Salto, $1.93; from Matamoras to San Miguel, and vice versa, $3. Baggage allowance either on local or through tickets is precisely the same number of pounds as given for the other Mexican roads.

Freight rates from Laredo to City of Mexico and vice versa are, on an average, for Class A, 9½ cents; class 1, 5¼ cents; class 2, 3¾ cents; class 3, 3 cents per ton (2,204 pounds) per kilometer (0.6214 mile), and for car loads about half the ton rate. Rates from Matamoras to San Miguel, and vice versa, are: Class A, 12 cents; class 1, 6 cents; class 2, 4 cents; class 3, 3 cents, and for car loads about half the ton rate.

The Interoceanic Railway.—This road, although narrow gauge, is a potent competitor of the Mexican Railway. The aim of the Mexican Railway Company was to build the shortest possible line with the steepest workable gradients; that of the Interoceanic to make a similar connection, but with easier gradients, and passing through entirely different districts, where there was known to exist local traffic of an important kind.

The professed purpose of the Interoceanic is to connect the two oceans, the Atlantic and the Pacific, by establishing communication between Vera Cruz, as the Gulf terminus (the city of Puebla being the central point of the two sections), with a branch to Mexico City; thence southward to the rich sugar and mineral districts of Morelos, finally connecting with the main line at Chelpancingo, the capital of Guerrero. The finished section of this road traverses the States of Vera Cruz, Puebla, Tlaxcala, Mexico, and Morelos, touching the cities of Vera Cruz, Jalapa, Puebla, Cholula, Jojutla, and Amacusac, and the proposed line will cross the whole State of Guerrero, touching Chiautla, Textla, Chilpancingo, and Acapulco. The main line from Vera Cruz to Puebla and the branch to Mexico City and thence to Morelos, were opened for traffic more than two years ago, and the line from Puebla to Acapulco is well advanced, having 150 kilometers (93.2 miles) built, Chietla being the present terminus. The distance between Vera Cruz and the City of Mexico by the Interoceanic is 360 miles; from Mexico to Jojutla, 123 miles; from Puebla to Chietla, 94 miles; and from Virreyes to San Juan de los Llanos, 7 miles.

A train leaves Vera Cruz at 1.30 p. m. daily for City of Mexico, arriving at Jalapa at 6.28 p. m.; resuming next day at 5.50 a. m., it reaches Puebla at 12.16 p. m., arriving at City of Mexico at 6.23 a. m., same day. A train leaves City of Mexico daily at 7 a. m., arriving at Puebla at 12.45 a. m. and at Jalapa at 7.25 p. m.; resuming next morning at 6.55, it reaches Vera Cruz at 11.54 a. m. Accommodation trains run daily from City of Mexico to Texcoco and Ozumba, and from Puebla to San Martin. Trains leave City of Mexico daily at 7.45 a. m., arriving at Jojutla at 4.32 p. m.; returning, leave Jojutla at 9.25 a. m., reaching City of Mexico at 7 p. m. Trains leave Puebla daily at 7.30 a. m., arriving at Chietla at 12.35 a. m.; returning, leave Chietla at 2.05 p. m., arriving at Puebla at 7.08 p. m. Trains leave Virreyes at 10.20 a. m. and at 2.30 p. m. for San Juan; returning, leave San Juan at 9.25 a. m. and 2.30 p. m., arriving at Virreyes at 9.50 a. m. and 2.55 p. m. Baggage allowance is the same as given by the other roads.

Connections: At City of Mexico, with Mexican Central and Mexican National railroads for points north and west; at Otumba, with Mexican Railway; at Irolo, with Hidalgo Railway for Pachuca; at Puebla, with Mexican Southern for Oaxaca, with Mexican Railway for Tlaxcala, and with Industrial Road (animal traction); for Cholula and San Marcos, with the Nautla Railroad and Mexican Railway; at Jalapa, with tramway for Coatepec; at Vera Cruz, with Mexican Railway for Alvarado, and with steamers for Gulf ports, Havana, United States, and Europe; at Compania, with tramway for Chalco; at Yantepec, with private conveyance for Cuernavaca; at Jojutla, with stage for principal towns in the State of Guerrero.

First-class passenger rates: From Vera Cruz to Jalapa, $2.70; to Oaxaca and return, $26.50; to Puebla and return, $13; to City of Mexico and return, $20. From Jalapa to San Marcos, $3.11; to Puebla, $4.23; to Irolo, $6.63; to City of Mexico, $8.47. From City of Mexico to Texcoco and return, $1.50; to Otumba, $1.43; to Irolo, $1.84; to Puebla, $3.06 (round trip, $4); to San Marcos, $5.37; to Jalapa, $8.47 (round trip, $15); to Vera Cruz, $11.17 (round trip, via the Mexican Railway, $22); to Ameca and return, $2; to La Compania and return, $1.25; to Cuautla and return, $4; to Jojutla and return, $7; to Oaxaca and return, $17.50. Baggage allowance is the same as given by the other roads.

Through freight rates from Mexico to Vera Cruz, and vice versa, are the same as those of the Mexican Railway, but local rates are: Class A, 12 cents; class 1, 6 cents; class 2, 4½ cents; class 3, 3½ cents, per ton (2,204 pounds) per kilometer (0.621 mile). On car-load lots the same discount is allowed as by the competing lines. Rates for exportation from Jojutla, Mexico, Irolo, Matamoras, Puebla, and Jalapa to Vera Cruz are: Class 1, 2¼ cents; class 2, 1⅛ cents; class 3, 1 cent per kilometer per ton of 2,204 pounds. Local rates from Jojutla to City of Mexico and from Matamoras to Puebla are the same as the local rates on the main line.

The Mexican International.—This standard gauge railway is an extension of the Southern Pacific. It is the only trunk line built in Mexico with American capital without a subsidy. Believing that a road from the Rio Grande toward the Pacific Ocean would cross a section of the Republic of Mexico susceptible of great development, this company obtained certain concessions in 1881, modified in 1882 and 1883, and work was immediately commenced at Ciudad Porfirio Diaz, and 89.37 miles of the main line were completed, and also 10.84 of the Lampazos branch, thereby reaching the coal fields of San Felipe. The track of the main line to Torreon was completed January 12, 1888, and operation of the road was commenced two months later. The San Pedro branch was built in 1890, and the main line was completed October 1, 1892, to Durango, the capital of the State of Durango.

This road traverses the States of Coahuila and Durango, and will extend through Sinaloa to reach Mazatlan, on the Pacific coast. It touches Eagle Pass, Allende, Sabinas, Monclova, Trevino, Jaral, Paila, Torreon, and Durango. The length of the main line, Ciudad Porfirio Diaz to Durango, is 540 miles; of the branches, Sabinas to Hondo, 12.43 miles; Hornos to San Pedro, 14.35 miles; and Pedricena to Velardena, 5.82 miles.

Connections: At Eagle Pass, with the Southern Pacific Company for all points in the United States; at Allende, with stage for Zaragoza; at Sabinas, with stage for San Juan de Sabinas; at Felipe, with stage for Juarez and Progreso; at Baroteran, with stage for Villa de Musquiz (Santa Rosa); at Monclova, with stage for Cuatro Cienegas and Sierra Mojada; at Trevino, with the Mexican Gulf Railway for Monterey, Tampico, and points on the National; at Jaral, with stage for Saltillo, the capital of the State of Coahuila; at Paila, with stage for Parras; at Hornos, with stage for Viesca; at Torreon, with the Mexican Central Railway for all points on that line and its connections. A through train leaves Ciudad Porfirio Diaz daily at 4 p. m., arriving at Sabinas at 6.05 p. m.; at Monclova, 10.10 p. m.; at Trevino, 1.35 a. m. (second day); at Jaral, 2.52 a. m.; at Paila, 4.15 a. m.; at Hornos, 5.51 a. m.; at Torreon, 7.05 a. m.; at Pedricena, 9.51 a. m.; at Durango, 3 p. m. Train leaves Durango daily at 8.20 a. m., arriving at Pedricena 12.42 a. m.; at Torreon, 3 p. m.; at Hornos, 4.15 p. m.; at Paila, 6.04 p. m.; at Jaral, 7.30 p. m.; at Trevino, 9.01 p. m.; at Monclova 12.20 p. m.; at Sabinas, 3.20 a. m. (second day). A daily train leaves Ciudad Porfirio Diaz at 8 a. m., arriving at Monclova at 6.30 p. m. same day; returning, leaves Monclova at 7.15 a. m. and reaches Ciudad Porfirio Diaz at 6.30 p. m.

First-class passenger rates: From Ciudad Porfirio Diaz to Allende, $2.10; to Sabinas, $4.70; to Baroteran, $5.80; to Monclova, $9.55; to Trevino, $14.40; to Jaral, $16.40; to Paila, $19.20; to Hornos, $22.55; to Torreon, $24.70; to Durango, $34.80. From Durango to Torreon, $10.20; to Paila, $15.70; to Jaral, $18.45; to Trevino, $20.45; to Mon-

clova, $25.30. From Torreon to Hornos, $2.20; to Paila, $5.60; to Jaral, $8.30; to Trevino, $10.35; to Monclova, $15.20; to Baroteran, $19; to Sabinas, $20; to Allende, $22; and to Piedras Negras, or Ciudad Porfirio Diaz, $24.70. Baggage allowance on through tickets, 150 pounds, and on local tickets, 33 pounds.

Freight rates from Ciudad Porfirio Diaz to Durango, or vice versa, average for Class A, 10 cents; class 1, 9 cents; class 2, 6¼ cents, class 3, 4¼ cents, per ton (2,204 pounds) per kilometer (0.6214 mile). On carload lots there is a reduction of 33 per cent on class 1; of 20 per cent on class 2, and 11 per cent on class 3.

Monterey and Mexican Gulf Railroad.—The original concession for this road is dated November 10, 1887, and gives the company the right to build to a port on the Pacific. The line extends from Trevino (formerly Venadito) on the International Railway, southeast through Monterey, Cadereyta, Montemorelos, Linares, and Victoria to Tampico, on the Gulf, a distance of 387 miles. It is a broad gauge, and traverses the States of Tamaulipas, Nuevo Leon, and Coahuila. The first portion of this road was opened from Monterey east on May 5, 1889; to Montemorelos, 68 miles, June 30, 1889; from Venadito to Villagran, 188 miles, on April 1, 1890; to La Cruz, 216 miles, August, 1890; to Victoria, 242 miles, October, 1890, and to Tampico, July 20, 1891.

Connections: At Trevino, with the International Railway for Torreon, Durango, and points north; at Monterey, with the Mexican National for points north and south on that road; at Tampico, with the Mexican Central for San Luis Potosi and Aguas Calientes, and with steamers for Gulf ports, United States, Havana, and Europe. Through trains leave Tampico daily for the north at 6 a. m., arriving at Victoria at 12.27 a. m.; at Linares, 4.36 p. m.; at Montemorelos, 6 p. m.; at Cadereyta, 8 p. m., and at Monterey, 9 p. m. Trains leave Monterey on the second day at 7 a. m., reaching Trevino at 10.04 a. m.; going south, trains leave Trevino daily at 1.45 p. m., reaching Monterey at 4.45 p. m.; leave Monterey, 5.55 a. m., and arrive the next day at Cadereyta at 6.57 a. m.; at Montemorelos, at 8.40 a. m.; at Linares, 10.26 a. m.; at Ciudad Victoria, 2.21 p. m., and at Tampico, 9.15 p. m.

A freight train leaves Tampico every day at 7.15 p. m., carrying a passenger coach, stopping over night at Ciudad Victoria and Monterey, and reaching Trevino at 12.45 a. m. on third day. From Trevino this train leaves at 1.30 p. m., and reaches Monterey at 6.40 p. m.; leaves Monterey 6.40 a. m., and arrives at Ciudad Victoria on the next day at 7.30 a. m.; reaching Tampico at 7.20 p. m. on the third day.

First-class passenger rates from Tampico are as follows: To Ciudad Victoria, $9.59; to Linares, $15.10; to Monterey, $21.10; to Trevino, $25.42. From Trevino to Monterey, $4.33. From Monterey to Cadereyta, $1.47; to Montemorelos, $3.96; to Linares, $6; to Ciudad Victoria, $11.59; to Tampico, $21.19. Baggage allowance is the same as that of the Mexican National.

Freight rates from Tampico to Trevino and vice versa are, for the first 100 kilometers (62.14 miles): Class A, 12 cents; class 1, 8 cents; class 2, 6 cents; class 3, 4 cents; then they average for Class A, 10 cents; class 1, 7 cents; class 2, 5½ cents; class 3, 3 cents, per kilometer (0.6214 mile) per ton (2,204 pounds). Car-load rates are: Class 1, 5½ cents; class 2, 5 cents; class 3, 3⅛ cents; but on the first 100 kilometers the rates are the same as above.

Mexican Southern Railway.—The company (English) operating this road was chartered on May 9, 1890, and a concession was obtained about a month later. In 1892 the line was completed to Tecomavaca, 140 miles from Puebla, and in March, 1893, work terminated at Oaxaca, making a total of 228 miles. It is narrow gauge, and traverses the States of Puebla and Oaxaca, and will eventually be built to Salina Cruz, on the Pacific Coast, and to Vera Cruz, on the Gulf. Its connections are: At Puebla, with the Mexican Railway and Interoceanic for Vera Cruz, Jalapa, Pachuca, Mexico City, and Izucar Matamoras; at Tehuacan, with Esperanza Railroad; at Oaxaca, with stage and private conveyances for Tehuantepec, Pluma, Hidalgo, Valle Nacional, Puerto Angel, ruins of Mitla, and the famous trees of Santa Maria del Tule.

Train leaves Pueblo at 6 a. m., reaching Tehuacan at 9.22 a. m., Tecomavaca at 12.29 a. m., Tomellin at 1.55 p. m., Oaxaca at 7 in the evening; leave Oaxaca at 6 a. m., reaching Tomellin at 11.07 a. m., Tecomavaca at 12.33 p. m., Tehuacan at 3.15 p. m., and Puebla at 7.40 in the evening.

First-class passenger rates from Puebla are: To Tehuacan, $3.92; to Tecomavaca, $6.89; to Tomellin, $7.90; to Oaxaca and return, $13.50. From Oaxaca to Tomellin, $3.37; to Tecomavaca, $4.38; to Tehuacan, $7.35; to Puebla, $11.23. A liberal allowance is made for baggage.

Freight rates from Puebla to Oaxaca, and vice versa, are: For class A, 12 cents; class 1, 6 cents; class 2, 4 cents; class 3, 3 cents, per ton per kilometer. Special rates given on car-load lots.

Hidalgo and Northwestern Railroad.—This road holds one of the first concessions granted, its date being January 28, 1878. The concession has since been modified several times. It is the pioneer line, connecting the Mexican Railway with the city of Pachuca. Within the last four years it has been extended to the City of Mexico. It is narrow guage, and traverses the Federal District and the States of Mexico and Hidalgo. The line is finished to Acapulco, a few miles out from Tulancingo. From Acapulco it will pass by Huachinango, Xicotepec (in the State of Puebla), Bixcuantla, and Teahicatlan to Tuxpan, the second port of Vera Cruz. It touches Mexico City, Pachuca, and Tulancingo. The length of the main line, City of Mexico to Romeros (Tulancingo), is 77 miles; of branches, Pachuca and Irolo, 43.5 miles, Tizayucan to Teoloyucan, 16.15 miles.

Connections: At Mexico City, with Mexican National, Mexican Central, Interoceanic, and Mexican Railways; at Tizayucan, with Mexican Railway; at Teoloyucan, with Mexican National and Mexican Central;

at Pachuca, with Mexican Central, and Mexican Railway, and with stage for Real del Monte Mines; at Romeros, with stage for Tulancingo and Huachinango.

Trains leave Mexico City daily at 7.15 a. m. and 3.45 p. m., reaching Tizayuca at 8.31 a. m. and 5.01 p. m.; Tepa, at 9.24 a. m. and 5.53 p. m., arriving at Pachuca at 10 a. m. and 6.30 p. m.; leaving Pachuca at 7 a. m. and 3.30 p. m., they reach Tepa at 7.40 a. m. and 4.10 p. m.; Tizayuca at 8.31 a. m. and 5 p. m., and arrive at Mexico City at 9.45 a. m. and 6.15 p. m. Passengers going to Tulancingo must take the morning train (7.15) for Pachuca and transfer at Tepa (9.24 a. m.), reaching Tulancingo at 11.45 a. m. Going to City of Mexico, passengers leave Tulancingo at 1.15 p. m. and transfer at Tepa at 3.50 p. m., arriving at 6.15 p. m.

First-class passenger rates: From Mexico City to Tizayuca, $1.59; to Tepa, $2.45; to Pachuca, $3.06; to Tulancingo, $3.06. From Pachuca to Tepa, 67 cents; to Irolo, $1.59; to Tizayucan, $1.53; to Tulancingo, $1.69; to City of Mexico, $3.06. From Teoloyucan to Tizayucan, 72 cents. Baggage allowance is the same as given by the Interoceanic Railroad.

Freight rates from the City of Mexico to Irolo and Pachuca are the same as those of the Central and the Interoceanic; but to Tulancingo are: Class A, 12 cents; class 1, 8 cents; class 2, 6 cents; class 3, 4 cents per kilometer (0.6214 mile) per ton (2,204 pounds).

Sonora Railway.—The original concession of this road was obtained September 14, 1880, and modified in 1881 and 1882. It was opened from Hermosillo to Guaymas, 90 miles, November, 1881, and to Nogales, 262 miles, on October 25, 1882. The line is owned by the Atchison, Topeka and Santa Fe Railroad Company, and with the New Mexico and Arizona Railroad forms the Sonora division of the Atchison company's system of roads. It is standard gauge, and traverses the whole State of Sonora, touching Guaymas, Hermosillo, Magdalena, and Nogales and Benson, Ariz. Its connections are: At Guaymas, with steamers for Alamos via Agiabampo for Topolobampo, Altata, Mazatlan, San Blas, Manzanillo, Acapulco, La Paz and other points in Lower California, and with stage for the Yaqui country; at Hermosillo, with stage for Ures and Arispe; at Magdalena, with stage and private conveyance for Altar and Arispe; at Nogales, with stage for Tucson, Ariz.; at Benson, Ariz., with Southern Pacific for points east and west.

Trains leave Benson daily at 7.30 a. m., and reach Nogales at 12.15 a. m.; leave Nogales at 2.37 p. m., arriving at Magdalena at 9.10 p. m., Hermosillo at 6.04 a. m., and arrive at Guaymas at 12.14 a. m., second day. Going north, trains leave Guaymas daily at 1.40 p. m., arriving at Hermosillo at 7.20 p. m.; Magdalena, 3.50 a. m. (next day); Nogales, 8.20 a. m., arriving at Benson at 2.40 p. m.

The first-class passenger rate is 3 cents per kilometer (0.6214 of a mile). From Benson to Nogales the fare is $4.33, United States currency; to Magdalena, $6.48, Mexican currency; to Hermosillo, $12.69,

and to Guaymas, $17.01. From Guaymas to Hermosillo, $4.32; to Magdalena, $10.17; to Nogales, $12.75; to Benson, $17.01. Tickets can be bought from the Mexican Central from City of Mexico to Benson for $78.02, Mexican currency. Local baggage allowance, 33 pounds; on through tickets, 150 pounds.

Freight rates per kilometer (0.6214 of a mile) are:

Distances.	Price per ton.			
	Class A.	Class 1.	Class 2.	Class 3.
1 to 150 kilometers	$0.12	$0.06	$0.04	$0.02¾
151 to 300 kilometers	.09			
151 to 400 kilometers		.05¾	.03¾	.02⅜
301 to 500 kilometers	.05			
401 to 500 kilometers		.05½	.03½	.02¼
In car-load lots.				
1 to 75 kilometers		.05¾		.02⅜
1 to 150 kilometers	.10			
1 to 185 kilometers			.03⅞	
76 to 100 kilometers				.02
76 to 150 kilometers		.05⅛		
101 to 500 kilometers				.01½
151 to 225 kilometers		.04		
151 to 300 kilometers	.08			
186 to 400 kilometers			.02⅛	
226 to 300 kilometers		.03		
301 to 500 kilometers	.04	.02⅛		
401 to 500 kilometers			.02	

Mexican Northern.—The concession for this road was obtained March 20, 1890, and the company operating was chartered in the June following. The road was opened to Rincon in February, 1891, and the entire line (81.25 miles) was in operation by July of the same year. It is a broad-gauge road, and runs from Escalon, a station on the Mexican Central, in Chihuahua, to Sierra Mojada, a mining town in Coahuila. At Sierra Mojada connection is made with stage for Cuatro Cienegas and Monclova.

Trains run from Escalon daily at 4 p. m., reaching Sierra Mojada at 7.15 p. m.; leaving Sierra Mojada daily at 7.15 a. m., and reaching Escalon at 10.30 a. m.

The first-class passenger rate is 5 cents per kilometer from Escalon to Sierra Mojada; from Sierra Mojada to Escalon the fare is $6.25. Baggage allowance, 15 kilograms (33 pounds).

Freight charges are: Special or class A, 12 cents; class 1, 10 cents; class 2, 7 cents; class 3, 5 cents per kilometer (0.6214 mile) per ton of 2,204 pounds in quantities less than a car load. For car-load lots 10 per cent reduction is made.

Alvarado Railroad.—The original concession for this road was granted on May 4, 1875, but was modified in 1878, 1888, and 1890. The route designated in the decrees was to be from the city of Vera Cruz to Alvarado, a distance of 70 kilometers (43.50 miles) south, with a branch to Anton Lizardo, and from some convenient point on the Rio San Juan, and opposite Alvarado, to proceed south, to connect with the Tehuantepec Railway. The road is in operation to Alvarado, and already located to Joltipan on the Tehuantepec Railroad. At Vera Cruz it

connects with the Mexican and Interoceanic railways for Jalapa, Cordoba, Orizaba, Puebla, Pachuca, and Mexico City, and with steamers for Gulf ports, Cuba, United States, and Europe; at Alvarado, with river steamers for Tlacotalpan, Cosamaloapan, Textepec, San Juan Evanglista, and San Andres Tuxtla, via Tlacotalpan, by animal conveyance.

Trains leave Vera Cruz daily at 11 a. m., arriving at Medellin at 11.50 a. m., and at Alvarado at 4.30 p. m.; returning, leave Alvarado at 7 7 a. m., arriving at Vera Cruz at 2 p. m.

First-class passenger rate, 3 cents per kilometer. First-class fare from Vera Cruz to Medellin, 46 cents; to Alvarado, $2.14; from Alvarado to Medellin, $1.68.

Freight rates: Special, 12 cents; first class, 6 cents; second class, 4 cents; third class, 3 cents per kilometer per ton of 2,204 pounds.

Manzanillo and Colima Railroad.—The original concessions of this road (from Toluca to the Pacific Ocean) were obtained by the Mexican National Railroad Company in 1872 and 1877, but, by subsequent arrangement, the Mexican National Construction Company took over the concession for building a line from Manzanillo, the best port in Colima, to some point in the interior. It is a narrow-gauge line and is operated to Colima, the capital of the State of Colima, having a length of 94 kilometers (58.41 miles). It connects at Manzanillo with steamers for Pacific Coast ports, and at Colima with stage or private conveyance for Zapoltan and Guadalajara.

Trains leave Manzanillo at 2 p. m., arriving at Colima at 6 p. m.; returning, leave Colima at 7 a. m., arriving at Manzanillo at 11 a. m.

First-class passenger rate, 4 cents per kilometer (0.6214 mile). First-class fare from Colima to Manzanillo, or vice versa, $3.88.

Freight rates: Special, 12 cents; first class, 6 cents; second class, 4 cents; third class, 3 cents per kilometer per ton.

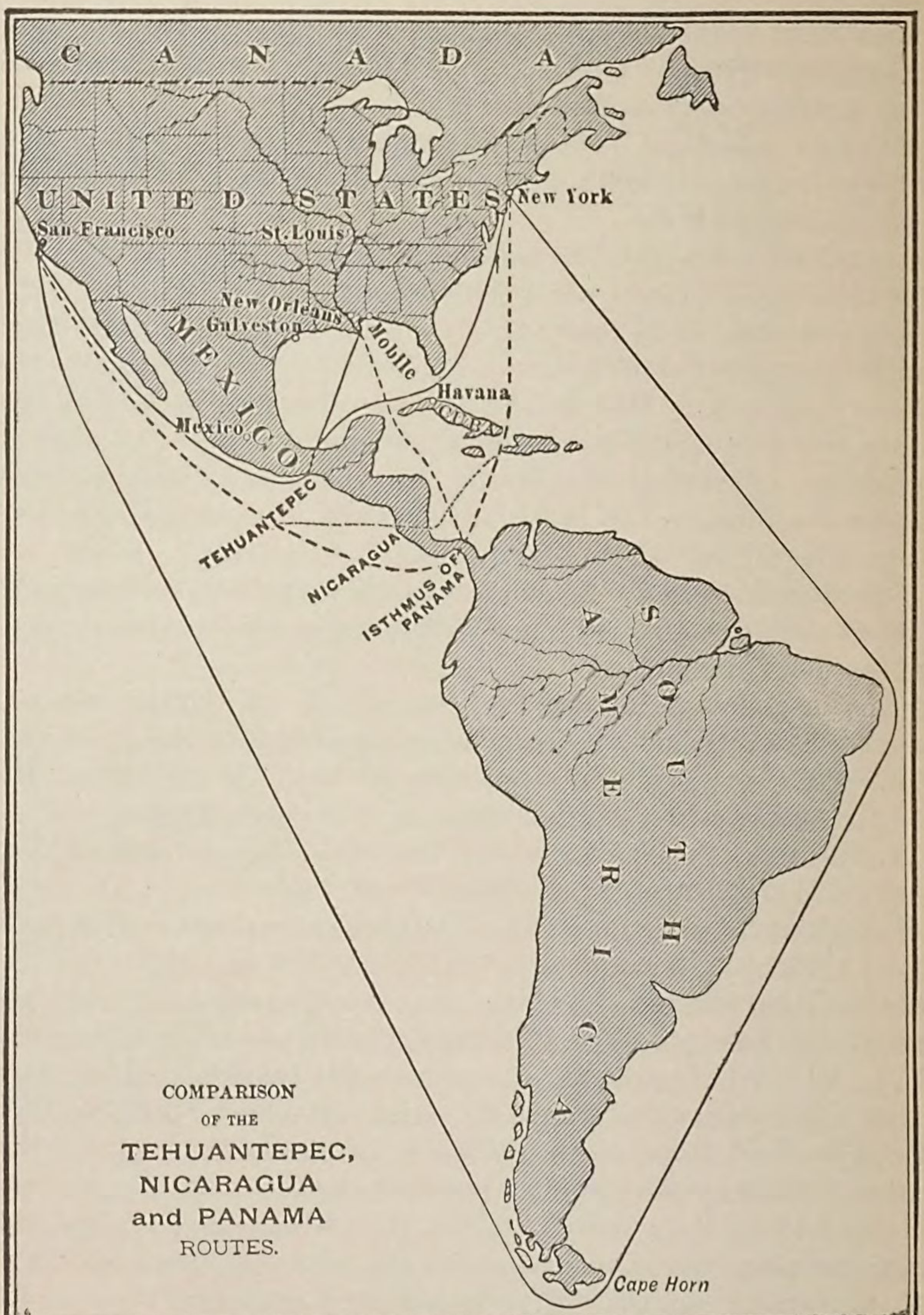
Sinaloa and Durango Railroad.—The original concession was granted August 16, 1880, and modified in 1881, 1882, 1886, and 1888. Under its first concession it was to have been an extensive system, from the port of Altata to the city of Durango, via Culiacan and many other interior points, and having various connections with coast towns northward. Only 61 kilometers (37.91 miles), however, have been built from Altata to Culiacan, and these are in operation in connection with two small steamers owned by the company engaged in the coasting trade.

Trains leave Altata daily at 6.30 a. m., arriving at Culiacan at 9.10 a. m.; returning, leave Culiacan at 6 a. m., reaching Altata at 8.30 a. m. At Altata trains connect with steamers for Pacific coast ports, and at Culiacan with stage and private conveyance for Sinaloa, Tamazula, Casa, and San Ignacio.

First-class passenger rate, 3 cents per kilometer (0.6214 mile). First-class fare from Altata to Culiacan, or vice versa, $1.90.

Freight rates are: Special, 10 cents; first class, 7 cents; second class, 5 cents, third class, 4 cents per ton per kilometer (10.6214 mile).

Tehuantepec Railway.—This road, now within 25 miles of completion, is destined to be one of the most important in the Republic. The project was to build across the Isthmus of Tehuantepec and connect the Atlantic and Pacific oceans. The idea of a highway for this purpose is very old, dating from the time of Cortez. Surveys and plans have been



COMPARISON
OF THE
TEHUANTEPEC,
NICARAGUA
and PANAMA
ROUTES.

made from time to time, but those of Captain Eads take the first place. The first serious efforts to realize this great work began in 1879, when an American company obtained a concession, but, unfortunately, the company was declared bankrupt in 1882. In 1883 the Mexican Government undertook to build the road, and laid rails for a distance of

some 40 kilometers (24.85 miles). In 1889 and 1890 about 100 more kilometers (62.14 miles) of rails were laid under the McMurdo contract, and it was supposed that there remained only 100 kilometers more to build. In 1891 the McMurdo concession was rescinded and a new contract was made with Stanhope, Corthell & Hampson. By virtue of the authorization which Congress gave the Executive last fall, a contract was entered into with Stanhope & Corthell for the completion of the road. The completed line now measures over 255 kilometers (158.46 miles), and less than 25 miles are lacking for the termination of the shortest interoceanic line in Mexico. The road is broad gauge and traverses the States of Vera Cruz and Oaxaca, touching Coatzacoalcos, Minatitlan, Suchil, Tehuantepec, and Salina Cruz. At Coatzacoalcos it connects with steamers for Gulf ports, Havana, United States, and Europe; at Tehuantepec, with private conveyance for Oaxaca, Miahutlan, and Pachueta, and at Salina Cruz, with steamers for Tonala, San Benito, and other Pacific coast ports.

There are no regular passenger trains running as yet, but two coaches are attached to freight trains carrying material, etc., which carry passengers (fare, 3 cents per kilometer = 0.6214 miles) to the end of construction, and then transfer by coach or private conveyance to other sections.

Tehuantepec Railway vs. Nicaragua and Panama canals.—In order that the commercial interests of the United States may know the distances saved between shipping points of the world, I append a table, approved by the Mexican Government and used by Minister Matias Romero in his pamphlet entitled El Ferrocarril de Tehuantepec:

From—	To—	Via Tehuantepec Railway.	Via Nicaragua Canal.	Via Panama Railway.
		Miles.	*Miles.*	*Miles.*
New York	San Francisco	4,925	5,651	6,107
New York	Puget Sound	5,647	6,524	6,855
New York	Sitka	6,347	7,113	7,555
New York	Behring Straits	7,788	8.524	9,101
New York	Acapulco	2,722	3,507	3,988
New York	Mazatlan	3,476	4,232	4,675
New York	Hongkong	11,597	12,313	12,645
New York	Yokohama	9,984	10,626	11,211
New York	Melbourne	11,068	11,357	11,471
New York	Auckland	9,345	9,745	9,813
New York	Honolulu	6,566	7,390	7,705
New York	Callao	4,661	4,312	3,873
New York	Guayaquil	4,141	3,774	3,303
New York	Valparaiso	6,370	5,774	5,337
New Orleans	San Francisco	3,561	4,776	5,415
New Orleans	Acapulco	1,454	2,631	3,296
New Orleans	Mazatlan	2,027	3,357	3,983
New Orleans	Callao	3,393	3,436	3,181
New Orleans	Valparaiso	5,040	4,899	4,644
Liverpool	San Francisco	8,274	8,783	9.071
Liverpool	Acapulco	6,076	6,639	6,952
Liverpool	Mazatlan	6,714	7,364	7,640
Liverpool	Auckland	12,584	12,877	12,777
Liverpool	Guayaquil	7,379	6,848	6,267
Liverpool	Callao	7,899	7,444	6.837
Liverpool	Valparaiso	9,356	8,906	8,301
Liverpool	Honolulu	9,805	10,522	10,670
Liverpool	Yokohama	13,223	13,758	14,175
Liverpool	Melbourne	14,113	14,499	14,435

These remarkable savings in distance, says Manuel Rivera, a distinguished Mexican civil engineer, will no doubt be found equivalent to a great saving in time as well as freight, and this is what constitutes the great commercial feature of this road. Therefore, when completed the road will be of great benefit to some of the commercial ports of the United States.

Minor railways.—Among the many railways partially built and in operation, the following may be mentioned briefly: Potrero Cedral, Vanegas and Rio Verde, with a branch to Matehuala and Catorce, mining centers, and a connection with the Mexican National Railway, having 86 kilometers in operation; the Michoacan and Pacific, from Maravatio, on the Mexican National Railway, to the Trojos mining district, 55 kilometers, with right to continue, according to the concession, to various points in Michaocan and to the Pacific Ocean, and also connect with the Interoceanic at Cuernavaca or Yantepec; the Salamanca, Valle de Santiago and Jaral, 35 kilometers in operation, from its connection with the Mexican Central at Salamanca; the San Marcos, on the Mexican and Interoceanic railways, and Nautla, on the Mexican Gulf, with branches to Zacapoaxtla and Perote, 76 kilometers in operation; the Esperanza and Tehuantepec, 50 kilometers, connecting with the Mexican Railway at Esperanza and at Tehuacan with the Mexican Southern (the Oaxaca Railroad); the Cordova and Tuxtepec, 51 kilometers finished, to connect with the Mexican Railway at Orizaba, its present terminus being Matzarongo, a celebrated rice and sugar hacienda (plantation) a few miles from the River Tonto; the Mexico, Cuernavaca and Pacific, 31 miles finished, which will extend from the City of Mexico to the harbor of Acapulco, touching Cuernavaca, Jojutla, Tlapa, and Ametepec. A part of the country through which this last road will pass abounds in long-leaf pine and oak, which will give it considerable traffic in supplying Mexico with fuel, for which there is a good demand. The Cuernavaca Valley is one of the heaviest sugar districts in Mexico. It also produces aquardiente, molasses, rice, fruits, etc. Cuernavaca is one of the most charming summer resorts of Mexico and was the favorite resort of Cortez and Maximilian. This road is being rapidly pushed to completion.

YUCATAN RAILWAYS.

The railways in the State of Yucatan merit special mention. They have been built mainly with native capital. Most of them are standard gauge.

Merida and Progreso.—The original concession for the Merida and Progreso (via San Ignacio) Railway was decreed by the Government on the 17th of January, 1874, and modified April 26, 1875. This road (36 kilometers (22.37 miles) in length) was opened in 1881. At Progreso it connects with the steamers for Gulf ports, United States, Cuba (Havana), and European ports. At Merida it connects with

branches of the same system for Akil (Peto Railroad) and Izamal; for Campeche, via Macaxoni, by animal conveyance.

Trains leave Progreso daily at 9.30 a. m., arriving at Merida at 10.45 a. m.; trains leave Merida at 7 a. m. and reach Progreso at 8.30 a. m. First-class fare either way, 77 cents.

Freight rates are: Special, 10 cents; first class, 6 cents; second class, 4 cents; third class, 2½ cents per kilometer (0.6214 mile) per ton of 2,204 pounds. These rates apply also to the Izamal railroad.

Merida and Peto.—The concession for this road was granted March 27, 1878, and modified in the years 1882, 1886, and 1888. The direction of the road is from Merida to Peto, via Ticul and Tekax, with Lake Chaukanah and Partido de los Chenes, in the State of Campeche, as objective points. The road is open to Akil, a distance of 99 kilometers (61.52 miles), although 104 kilometers (64.62 miles) are built. This is a narrow-gauge line.

Trains leave Merida at 2 p. m., arriving at Akil at 6.15 p. m.; trains leave Akil at 5 a. m., arriving at Merida at 9.20 a. m. First-class fare either way, $2.02. Freight rates are: Special, 12 cents; first class, 6 cents; second class, 5 cents; third class, 4 cents per ton (2,204 pounds) per kilometer (0.6214 mile). These rates apply also to the Merida and Campeche Railroad.

Merida and Valladolid.—The original concession for this road was granted December 15, 1880, and modified in 1881, 1883, 1886, and 1888. The route designated in the decrees was to be from Merida to Valladolid, via Texkokob, Motul, Temax, and Cenoletto, with a branch road to Progreso and another from some point on the trunk line to Tizimin, via Espita. The road is opened from Merida to Progreso, a distance of 47 kilometers (29.21 miles); from Conkal to Tekax, 28 kilometers (17.40 miles); and from Conkal to Motul, 31 kilometers (19.26 miles).

Trains leave Merida at 5 p. m., arrive at Conkal at 5.30 p. m., and at Progreso at 6.30 p. m. Returning, trains leave Progreso at 2.30 p. m., arrive at Conkal at 3.30 p. m., and at Merida at 4. p. m. Trains leave Conkal at 6 p. m. and arrive at Tekax at 6.45 p. m.; returning, leave Tekax at 3 p. m., arrriving at Conkal at 3.55 p. m. A train leaves Conkal at 5.40 p. m., arriving at Motul at 6.45 p. m.; returning, leaves Motul at 2.20 p. m., reaching Conkal at 3.55 p. m.

The first-class passenger rate is one-half cent per kilometer (0.6214 mile). Fare from Merida to Progreso, or vice versa, is 73 cents; from Merida to Conkal, 25 cents; from Conkal to Tekax, or vice versa, 43 cents; from Conkal to Motul, or vice versa, 48 cents.

Freight rates per ton per kilometer (0.6214 mile) are: Special, 10 cents; first class, 5 cents; second class, 4 cents; third class, 3 cents.

Merida and Campeche.—The original concession for this road was granted September 14, 1880, but was modified in 1881, 1882, 1886, 1888, and 1889. The route designated in the decrees was to be from the city

of Merida to Campeche, via the town of Calkini, with a branch to Hunricina, and another to Mura. The road is open from Merida to Maxcanu, a distance of 59 kilometers, (136.66 miles), and from Campeche to Pomuch, a distance of 53 kilometers (22.93 miles), but 129 kilometers are built. This is a narrow-guage line.

Trains leave Merida daily at 6 a. m. and arrive at Maxcanu at 8.30 a. m.; returning, leave Maxcanu at 7 a. m., reaching Merida at 9.15 a. m. Trains leave Campeche at 2 p. m., reaching Pomuch at 4.40 p. m.; returning, leave Pomuch at 6 a. m., arriving at Campeche at 8.40 a. m.

First-class passenger rate is 2 cents per kilometer. Fare from Merida to Maxcanu, or vice versa, $1.21; and from Campeche to Pomuch, or vice versa, $1.09.

Freight rates are the same as for the Merida and Peto Railroad.

Merida and Izamal.—The concession for this road was granted May 15, 1884; modified in 1886, 1888, and 1890. The route of this road is from Campeche to Izamal, via Tekanto, 67 kilometers (41.63 miles), and is now open for traffic.

Trains leave Merida at 6 a. m., reaching Izamal at 8.55; returning, leave Izamal at 6 a. m., reaching Merida at 8.55 a. m.

First-class passenger rate, 2 cents per kilometer (0.6214 mile). First-class fare from Merida to Izamal, or vice versa, $1.37.

Freight rates are the same as for the Merida and Progreso Railroad.

2. NAVIGABLE RIVERS AND CANALS.

The first important river found in the extreme north of the Republic, on the Gulf side, is the Rio Grande, forming a portion of the boundary line between Mexico and the United States. It is navigable for a short distance from Matamoras to the interior for good-sized boats, and small craft ascend as far as 196 miles from this point.

There is communication on the Panuco River, between Tampico and Tantoyuquila, by steamboats, which, starting for the interior, run into the Guayalejo or Temesi, through the mouths of El Moralillo, and enter the Chairel Lake and the American Canal. For nearly the whole distance there is an average depth of more than 20 feet. Once in the Tamesi, the average depth is a little over 16 feet to the San Francisco ranch, where the rocky bed leaves little more than 4 feet, rendering navigation extremely difficult and at night impossible. The canalization of the Tamesi would be an easy task, the bottom being mostly of sand and mud, while the obstructions referred to could be blown up without difficulty.

Some years ago work was commenced on the Chijol Canal, between Tampico and Tuxpan. It is to be 250 miles long, and will be extended to the Lomas del Real, to drain the lagoons existing in the neighborhood, and thus improve the salubrity of Tampico. The connection of the Panuco with the Barbarena will be completed the required length and, with its completion, the abundant resources of the region will be made available. The Panuco itself is navigable for 80 miles.

A few months ago the Government made a contract with Emilio Rubio and Samuel Morales Pereira for the improvement and canalization of the River Tempoal, which empties into the Panuco close to Tampico. The new company organized for this important enterprise is authorized to work from the town of Panuco up the river. The work must be done so that the river may be fitted for traffic, the canalization of the river to be sufficient to allow the passage of boats of 60-tons burden. The company doing the work must finish it in proper shape within a specified time, and in payment for each kilometer of improvement made, the concessionaries are to receive from the Government 4,000 hectares (9,884 acres) of public land wherever desired, providing said work be approved by the secretary of public works.

The rivers Presas and Soto la Marina, in Tamaulipas, could be made navigable so as to reach, on the former, the towns of San Fernando and Mendez, and on the latter, the city of Soto la Marina. The Soto la Marina River receives the waters of numerous streams and of several rivers of considerable volume, and from the nature of its bed could be easily rendered navigable.

Among the lakes lying along the coast of Tamaulipas is the Laguna de la Madre, with a width varying between 10 and 26 miles. In view of its many communications with the Gulf, and with the fertile lands around it, its waters should be more largely utilized.

The Tuxpan River, in the State of Vera Cruz, which empties into the port having the same name, is navigable for about 60 miles, and, with a little dredging, a depth of 6 or 7 meters might readily be obtained.

The Papaloapam, San Juan, and Coatzacoalcos are open for vessels carrying from 8 to 12 feet. The Papaloapam is navigable for 90 miles; the San Juan for about 125 miles, and the Coatzacoalcos for more than 50 miles. On the Papaloapam and its tributaries, a franchise has been given to a Mexican company (Maclovio Ramos, No. 1 Angel street, City of Mexico, agent), with a subvention of $3,600 annually, to run small steamboats twenty times a month between Tlacotalpam and Tuxtepec, touching at Cosamaloapam, and between Anton Lizardo and San Juan Evangelista. Besides these, there are six more boats, belonging to the Vives Hermanos (Alvarado), and José L. Perez y Francisco Cházaro Hijos (Tlacotalpam), plying between Alonzo Lazaro, Alvarado, Tlacotalpam, San Nicolas, Chacaltianguis and Tuxtepec.

The Papaloapam and its affluents are in the best possible condition for canalization; their waters are placid, their currents seldom exceed a mile an hour, and the territory through which they run contains some of the richest of lands.

The Coatzacoalcos and its tributaries would, by canalization, develop an immense traffic for over 100 miles in the interior; as by opening the channel to the easternmost part of Oaxaca, vast quantities of products would be carried over its waters.

Tabasco is not supplied with railroads, but nature has provided her with many waterways, which traverse the State in all directions. The

Tauchiochapa, Gonalez, San Pedro, the majestic Grijalva, the Usumacinta, with its wealth of waters, and a large number of channels and streams, which by little labor and expense might be rendered navigable for vessels drawing 5 to 8 feet, would make together quite a system of navigation that would contribute not only to the welfare of that State, but also to that of Chiapas and Campeche.

From the Lake of Terminos, via Palizada, and by two different routes, the port of Frontera and the Usumacinta River may be reached. From Frontera, on steamboats following up the Grijalva, touching San Juan Bautista to Huimanguillo; and by changing to small crafts, ascent can be made on the Mescalapa to Tuxtla, and San Cristobal, the capital city of Chiapa, not far distant from the above towns, can be easily reached overland.

The Usumacinta joins the Grijalva at Tres Bocas, and runs thence toward the southeast, across the rich districts of Centro, Jonuto, Monte Cristo, Palenque, Balancan, and Tenosique. After penetrating the mountain region it becomes a boisterous torrent. The river's navigable length, about 125 miles, is almost three times that of the Grijalva, and the region which it waters is by no means inferior to the one drained by the latter. The waters of the Grijalva and Mescalapa, for a length of some 95 miles, penetrate the low mountains of Pichucalco, irrigate a section of country wherein the layer of tillable soil varies between 10 and 20 feet in depth, well watered by timely rains, and capable of producing, in the greatest abundance, all the useful plants of the tropical region. During the rainy season both the Grijalva and Mescalapa are apt to overflow, but this evil can be remedied by establishing regulating dikes at the Seco and the Conduacan. By deepening at some places the channel of the Mescalapa between San Juan Bautista and Huimanguillo, a permanent passage would be secured for vessels drawing from 6 to 10 feet from Frontera to the district of Huimanguillo.

On the rivers Grijalva and Usumacinta, franchises have been granted to two Mexican companies (Mauricio Horner and José Tamborrel, agents, City of Mexico), with a subvention of $5,400 annually to the first one (Grijalva River Mexican Navigation Company) for the purpose of running small steamboats fifty-four times during the year between Atasta and La Palma on the Grijalva and Atasta and the Port of Chiltepec on the Gonzalez. A subvention of $9,000 annually is given by the Government to the second one (Grijalva, Usumacinta and Palizada Mexican Navigation Company) to ply nine times a month from San Juan Bautista to Tenosique, on the Grijalva and Usumacinta, touching at Frontera, Palizada, Jonuto, Monte Cristo, and Balancan, and on the river Palizada from Palizada to the port of Carmen, in the State of Campeche.

In Campeche, the Lake of Terminos receives numerous rivers, some of which may be rendered navigable for short distances. Among them

are the Conception and the Mamantel, running through very rich forests. The Champoton, although naturally navigable for some distance, would, if rendered entirely fit for navigation, throw open to commerce the productive regions of the eastern part of that State. On the Pacific slope there are but few rivers that could be rendered navigable, owing to the short or turbulent course of most of them. Some, however, would repay the expense of improving their channels. The course of the Tehuantepec is 182 miles from its source in the district of Tlacolula (Oaxaca) to its mouth in the bay of La Ventosa, where it forms the port of the same name, the terminal point of the Tehuantepec Railway. The river runs through the thickly populated districts of San Carlos, Yautepec, and Tehuantepec, and its canalization would give life to an agricultural region which now lacks commercial activity. The Rio Verde undoubtedly admits of canalization for at least 62 miles of its course.

In Guerrero, the current of the few rivers emptying into the Pacific is for the most part too impetuous for navigation. The most important among them is Las Balsas, which, with its source in the State of Tlaxcala, has a length of 419 miles. Notwithstanding its volume of water, its rapid slope, and the sand bank it forms at the place where it discharges into the ocean, are serious obstacles to canalization; the expense attached to its improvement might, however, be justifiable in view of the rich resources in agriculture and stock raising of the thickly populated region through which it flows.

On the coasts of Colima, Jalisco, Sinaloa, and Sonora there are rivers of considerable importance for their volume of water, the length of their course, and the rich sections of country through which they run. The Coahuayana, Armeria, Chacala, Piginto, and San Pedro, are in favorable condition for canalization.

The Santiago may be utilized for a considerable distance. In this river there are obstacles, chiefly in the differences of level in its bed, presenting in some places fords with very rapid currents. These obstacles would call for sectional canalization, but with such a system the development of new industries and wealth in Jalisco and Tepic would provide for the well-being of many thousands of people.

The Mazatlan River is also in the best condition for canalization for about 62 miles, and this may also be said of the Culiacan, Sinaloa, and Fuerte.

Sonora has within its limits excellent rivers that may be turned to advantage for considerable distances. The Yaqui and Mayo both carry abundant water, have thoroughly good beds and outlets, and run through extensive and fertile plains, forming the tropical belt between the mountains and the sea.

The Colorado, emptying into the northern extremity of the Gulf of California, presents considerable difficulties. It will change its course at the caprice of a patch of sand, which, shifting now in one direction

and then in another, renders impossible, under present physical conditions, any permanent system of navigation. Nevertheless, a few flat steamboats ply its waters.

Such are the numerous rivers of Mexico, many of which are in the best possible condition for contributing to the development of the country, and for aiding great and profitable enterprises, especially as motor power.

3. PORTS AND HARBORS.

Nature has not been liberal in providing Mexico with available ports. On the Gulf coast there are open roadsteads where vessels at anchor are exposed to more or less danger, and bars and sand banks obstruct access to the shelters which the rivers would afford.

Matamoras, on the Mexican side of the Rio Grande, is a safe port, especially since the Government has completed works to prevent the periodical overflows which invariably follow the rainy season.

Tampico, at the mouth of the River Panuco, has been lately improved by the construction of jetties on the Eads system, and is now the finest harbor on the Gulf seaboard. From the mouth of the river, for 20 miles, the stream is about half a mile wide, with an average depth of 35 feet, forming a completely land-locked harbor, where vessels drawing 20 eet can ride in safety.

Leagued with the future of Tampico is the port of Tuxpan, which is situated at the mouth of the river of the same name. The entrance has been obstructed by a bar which carried a depth varying from 10 to 14 feet during the rainy season, but the Government has constructed two jetties from the shore seaward, and dredged a canal at the mouth of the river, at a total expense of $283,680.

Vera Cruz was the principal port on the Gulf until Tampico was improved. It has a light-house on the southeast extremity of the castle on the Island of San Juan de Ulua. The anchorage ground is between the castle and the city, and affords very little security to vessels when the heavy "northers" sweep across the Gulf. The depth of water is sufficient only for vessels drawing about 19 feet; those which draw more have to anchor at the Island of Sacrificios, where there is greater depth and protection, but too far from the city for unloading cargo. To obviate this the Government is building a breakwater from the mainland to the Gallega reefs; another, on the Gallega reefs from the northwest extremity of the former to the eastern end of the fort on the Island of Ulua, and is dredging the channel thus formed. The total cost of these works is to be $5,615,000.

Alvarado and Anton Lizardo have been declared by the Government engineers as high-water ports, both have good anchorage, and both are spacious harbors.

Tlacotalpam is on the banks of a lagoon, 15 miles southeast of Alvarado. Vessels drawing 13 feet of water can enter.

Minatitlan is 18 miles up the River Coatzacoalcos, on the Gulf side of the Isthmus of Tehuantepec. The river is navigable from the town to the mouth, having sufficient water for the largest vessels, though the bar prevents the entrance of ships drawing more than 12 feet. But in connection with the construction of the Tehuantepec Railway, the Government is making a channel of 26 feet depth which, together with piers, warehouses, etc., will probably cost $4,000,000. Minatitlan, or properly speaking, Coatzacoalcos, will be a harbor destined soon to be the entrepôt for a large interoceanic business.

Frontera is the entrance to the River Grijalva, in the State of Tabasco. It is the port for San Juan Bautista, which is situated some distance up the river, to which point it has water for large vessels. The entrance is obstructed by a bar, with varying depth of water. During the rainy season it carries from 9 to 11 feet, and in the dry season only 7 feet. Large vessels have to anchor outside the bar, exposed to the "northers" and the heavy seas they create.

Campeche is an open roadstead, where vessels drawing 10 feet anchor about a mile from the shore, and those drawing over 15 feet, from 6 to 7 miles off.

Laguna de Terminos (Carmen) is a port formed by the island of Carmen. The anchorage is safe inside the bar, which carries from 12 to 14 feet of water, and obstructs the entrance to the lake. Large vessels anchor outside this bar and discharge and receive cargo from launches.

Sisal is an open roadstead, with good holding ground, although exposed to the northers. It was formerly the chief port of Yucatan, but the removal of the custom-house to Progreso has destroyed its foreign trade.

Progreso is another open roadstead where vessels anchor in 4 fathoms of water about 2 miles from the shore. It has a light-house, situated some 4 miles southeast from the anchorage off the town.

On the Pacific coast there are some good harbors:

San Benito, in the State of Chiapas, and close to the frontier of Guatemala, is an open roadstead.

Tonala, 120 miles northwest of the former port, is another open roadstead. The Government spent $900,000 in building a pier at each of these ports, but the heavy gales which occur periodically on this coast destroyed them.

Ventosa, at the mouth of Tehuantepec River, and 25 miles from the town of the same name, is an open bay.

Salina Cruz, now the port on the Pacific end of the Tehuantepec Railway, is an open roadstead, and affords no shelter for vessels, but in the last contract made to terminate the Tehuantepec Railway the construction of an iron pier and a breakwater was included.

Huatulco, at the western extremity of the Gulf of Tehuantepec, is well sheltered from the southerly winds. A natural breakwater, in the shape of two islands lying opposite this port, has been the means of

forming a channel from 7 to 9 fathoms in depth. The Government, as well as the Mexican Southern Railway Company, could well afford to make this port the Pacific terminus of their respective roads.

Puerto Angel, south of the State of Oaxaca, is protected from the southwest winds, and the bay affords an anchorage of 12 or 13 fathoms of water. The landing, however, is somewhat difficult on account of the waves, which break heavily on the beach.

Acapulco, in the State of Guerrero, and the projected Pacific coast terminus of the Interoceanic Railway, is a fine land-locked harbor, sheltered on the north by mountains, which rise to the height of from 2,000 to 2,700 feet. The depth of water varies from 5 to 25 fathoms. There is no pier, and cargoes are discharged into launches, which carry them to the beach.

Manzanillo, in the State of Colima, is a small and comparatively safe port, which the Mexican National Construction Company will make the terminus of its railway from Guadalajara.

Chamela, in the Bay of Panela, State of Jalisco, is comparatively sheltered, except from the southerly winds, which prevail in July and August, when very heavy seas roll in.

San Blas, at the mouth of the Santiago River, is open to the full sweep of the Pacific Ocean; anchorage, 5 to 7 fathoms.

Mazatlan, in the State of Sinaloa, is one of the best ports on the Pacific coast, and is partially sheltered; anchorage, from 5 to 7 fathoms.

Altata, the terminus of the Culiacan Railroad, is partially sheltered; anchorage, 5 to 6 fathoms.

Playa Colorado is almost an open roadstead, where vessels anchor in from 5 to 7 fathoms, about 4 miles from the shore.

Guaymas, in Sonora, is at the mouth of a small river, which empties into the Gulf of California. It has a good bay, protected from the winds by surrounding hills. Vessels anchor close to the town, in about 3 fathoms of water.

La Libertad, north of Guaymas, has a safe and commodious bay, with sufficient water for all vessels.

Pichillingue is an extensive bay on the eastern coast of Lower California, and affords good anchorage, with deep water, and is a safe port.

La Paz is a bay in the same territory, where small vessels anchor about a mile from the shore; large ships anchor under the island of San Juan Nepomuceno, in 5 to 10 fathoms of water, about 9 miles out.

Ensenada de Todos Santos, on the west coast, is a bay, where there is comparatively safe anchorage, and partial protection for ships.

4. OCEAN LINES.

The development of maritime commerce, in connection with activity in the interior trade since 1877, has induced the Government to give it further impulse by granting concessions to various ocean transporta-

tion companies and individuals. Subsidies and special privileges have been given to the following companies:

The New York and Cuba Mail Steamship Company (American), J. Ritter, Gante, No. 1, Mexico City, and James E. Ward & Co., 113 Wall street, New York City, agents; has no subvention, but has special exemptions. Steamers make 104 trips (52 required) regularly from and to New York, Havana, Progreso, Vera Cruz, Tuxpan, and Tampico and Frontera and Campeche, alternately, reaching Havana in 4 days, Progreso 7 days, and Vera Cruz 9 days. First-class fare to Vera Cruz, $55 gold, and to Mexico City, $60 gold.

The German Imperial Mail, Busing & Co., Vera Cruz, agents; has no subvention, but has special exemptions. The line must make 12 voyages yearly, starting every month from Vera Cruz, for Tampico, Progreso, Havre, and Hamburg.

The Harrison Line and The West Indian and Pacific Steamship Company (English), Juan Ritter, Gante, No. 1, Mexico City, agent; have no subventions, but have special privileges; must make 12 voyages annually, starting monthly from Liverpool, and touching Paillac, Barbados, St. Thomas, Trinidad, La Guayra, Puerto Cabello, Curaçao, Santa Marta, Sabanilla, Cartagena, Port au Prince, Kingston, Colon, Vera Cruz, Tampico, and New Orleans, with the option of touching at Progreso, Campeche, and Tuxpan when necessary.

Romano y Cia. (Mexican), Indalicio Sanchez Gavito, No. 12, San Agusten, Mexico City, agent; receives a subvention of $1,000 per round trip. Must make 36 trips annually between Tuxpan, Vera Cruz, Coatzacoalcos, Minatitlan, and Frontera, with the privilege of stopping at San Juan Bautista, Laguna, Campeche, Progreso, Tampico, and Tecolutla.

Spanish Transatlántica, José D. Bousquet, No. 3 Tiburcio, Mexico City, agent, has no subventions; but has special exemptions. These steamers make 36 through trips (12 annually required) between Vera Cruz, Frontera, Campeche, Progreso, Tampico, Tuxpan, Havana, Coruna, Santander, Cadiz, Barcelona, Liverpool, Havre, and New York. Leave New York on the 10th of the month for Havana, Progreso, and Vera Cruz; on the 13th for Havana, and on the 30th for Havana, Santiago de Cuba, Guayra, Puerto Cabello, Santa Marta, Puerto Limon, and Vera Cruz; leave Vera Cruz on the 4th for Progreso, Havana, Puerto Rico, and Spanish ports, connecting with its own steamers at Havana (here transferring with its own steamers) for New York and Spanish ports, and on the 24th for Progreso, Havana, and New York. First-class fare from Vera Cruz to Progreso, $22.50, Mexican currency (round trip, $33.75); to Havana, $36 (round trip, $54), and to New York, $82.25 (round trip, $116.25).

Compagnie Générale Transatlantique (French), E. Dutour, No. 12 Guardiola, Mexico City, agent; has no subvention, but special exemptions. These steamers make 52 trips (12 annually required as per con-

cession) and touch between Havre and Vera Cruz at Antwerp, Bordeaux, St. Nazaire, Santander, Corunna, New York, St. Thomas, San Juan de Puerto Rico, Puerto Plata, Cape Haitien, Port au Prince, Havana, Tampico, and New Orleans. Steamers leave New York for Mexico and Havana on the 1st of each month and leave Vera Cruz on the 12th of each month. First-class fare from Vera Cruz to Havana, $30, Mexican currency.

New York, Mobile and Mexico Steamship Line (American), Emeterio de la Garza, 12 Rosales, Mexico City, agent; has no subvention, but enjoys special privileges. Steamers make monthly trips between Mobile and Tampico.

Gonzalez Direct Line (Mexican), Manuel Peniche, 4 Angel street, Mexico City, agent; enjoys special privileges. Steamers ply from Vera Cruz to New York, via Progreso and New Orleans, every month.

French Commercial Steamship Company, Lavie & Co., Mexico City, and F. J. Muñoz, Vera Cruz, agents; has no subvention, but special exemptions. Steamers leave Havre monthly, touching at Amberes and Bordeaux, reaching Vera Cruz about the 18th or 20th of the month; returning, they touch at Tampico and New Orleans.

M. Berreteaga & Co. Line (Mexican), Manuel Sanchez Marmol, 17 Cerca de Sto. Domingo, Mexico City, agent; has no subvention, but enjoys special exemptions. Steamers leave Vera Cruz for Progreso once a month.

Pacific Mail Steamship Company (American), H. J. Bulloy, New York City, Alex. Center, San Francisco, and R. B. Gorsuch, Mexico City, agents; has a subvention of $2,500 a month. Steamers leave New York on the 10th, 20th, and 30th of the month, from pier foot of Canal street, North River, for Colon, where connection is made with the Panama Railroad. From Panama steamers leave for San Francisco, touching at San Benito, Tonala, Salina Cruz, Port Angel, Acapulco, Manzanillo, San Blas, and Mazatlan. Steamers leave San Francisco on the 8th, 18th, and 28th for Panama, touching at the foregoing Mexican ports. First-class fare (in gold) from San Francisco to Mazatlan, $45; to San Blas, $50; to Manzanillo, $50; to Acapulco, $60; and to Puerto Angel, Salina Cruz, Tonala, and San Benito, $65.

Redo Line (Mexican), J. Redo, 22 Cadena street, Mexico City, agent; has a subvention of $1,500 per round trip. Steamer *Alejandro* sails from Guaymas every month for La Paz, Altata, Mazatlan, San Blas, and Manzanillo.

Izaguirre & Co. Line (Mexican), Lauro de la Barra, Mexico City, agent; has no subvention, but enjoys special privileges. Steamer *Porfirio Diaz* makes 10 to 12 trips yearly between Manzanillo, Chamela, San Blas, Mazatlan, Altata, La Paz, Agiabampo, and Guaymas.

Sinaloa and Durango Railway Line (Mexican), Sebastian Camacho, No. 9 Empedradillo, Mexico City, agent; has no subvention, but enjoys special exemptions. Steamers *Mazatlan* and *Altata* run 3 times a

month from Manzanillo to San Blas, Mazatlan, Altata, Guaymas, and Agiabampo.

Pacific Coast Steamship Company (American), Goodall, Perkins & Co., No. 10 Market street, San Francisco, and Ignacio Sepulveda, 7 Gante street, Mexico City, agents; has no subvention, but enjoys special exemptions. Steamer *Newbern* leaves San Francisco on the 1st of each month for Ensenada de Todos Santos, Bahia de la Magdalena, San Jose del Cabo, La Paz, Guaymas, and Mazatlan.

There are other lines of importance which ply in Mexican waters, but enjoy no privileges whatever. Such lines are:

Morgan Line: Steamers leave Morgan City, La., for Vera Cruz, stopping at New Orleans, Galveston, and Matamoras, twice a month.

Maldonado Company, which makes from 12 to 30 trips yearly between New York and Progreso, and New Orleans and Progreso.

Steamers *Campechano* and *Ibero* make monthly trips between Vera Cruz and Progreso, stopping at Frontera, Laguna, Champoton, Campeche, and Celestum.

Royal Mail Steam Packet Company (English), making 24 trips annually between Vera Cruz and English ports.

Hamburg-American Packet Company (German), touching once or twice a month at Vera Cruz for European ports.

Steamer *Fenix* sails every month from Progreso for Campeche, Laguna, and Frontera.

Steamer *J. W. Wilson* runs between Vera Cruz and Tuxpan, and between Tuxpan, Tecolutla, and Cazones, once a month.

Steamer *Tlacotalpam* runs weekly between Vera Cruz, Tlacotalpan, and Alvarado.

Steamer *Yaqui* runs weekly between Guaymas and Medano on the River Yaqui.

The Sonora Railway Company runs two steamers twice a month between Guaymas, La Paz, Santa Rosalia, Agiabampo, Topolobampo, Mazatlan, Perihuete, San Blas, and Manzanillo.

The burden capacity of the steamers employed by the foregoing lines is not less than 2,000 nor more than 4,000 tons.

The Government seems to be now decided not to give any new concessions with subsidies, either for railroad or steamship lines. The commercial relations of Mexico with foreign countries have now attained such magnitude as to render it unnecessary to offer subsidies, and the maritime traffic is sufficient in itself to afford a reasonable profit for the steamship companies.

5. HIGHWAYS AND STAGE LINES.

Highways have not been the means by which Mexico has attained its present interior development. Good roads of any great length and easy wagon transportation have always been a matter of sheer impossibility, and the best efforts in this direction of the industrial rulers of Mexico have been frustrated by natural causes.

The extraordinary configuration of the country and the heavy rains during the summer would demand an enormous appropriation to maintain wagon roads in first-class order. The present administration has been aware of this, and to furnish a substitute it has offered inducements to railroad enterprises by subsidies, land grants, and special privileges, and this saves the country from a heavy burden in the shape of a road tax.

There are a few highways of importance which can be mentioned briefly. The historical road of Vera Cruz is one of the best. This road is wide, in some places 30 meters (98.43 feet) in width, and has an easy grade almost all the way through from Perote. Starting from Vera Cruz, it runs for some miles through great plains, and then begins to ascend gradually, until it reaches Jalapa (5,000 feet above the sea), 75 miles from Vera Cruz. Thence the ascent is at an incline of 5 feet in 100, winding upward in a perfect zigzag, until the edge of the high plateau is reached. After leaving Perote (about 8,000 feet above the sea level), the road widens again, and a plain about 50 miles long is crossed. At San Marcos the road branches south and west. In the former direction, it follows the Interoceanic Railway to Puebla and Tlaxcala; in the latter, it follows the Mexican Railway almost all the way to the City of Mexico, the grade being nearly level. This is the road that Cortes took in his famous invasion of the land of the Montezumas.

The Cuernavaca road is another relic of the olden times. A stage leaves Huipulco, on the Tlalpam steam line (Mexico City to Tlalpam), every day at 7 a. m. (fare, $2.50), and reaches Cuernavaca at 3 p. m. The road from Huipulco, before ascending the hill to San Mateo, is wide, but dusty and sandy, and so continues to the next ascent at Topilejo. At this point one of the grandest of panoramas presents itself to the eyes of the traveler. The most important section of the Valley of Anahuac is before him. To the east, and dimly perceived through the heavy mists, the snow-clad sides of Popocatepetl can be seen; then, a little toward the north, the lower fleecy slopes of Iztaccihuatl are visible; far to the northeast the waters of Lake Texcoco shine and glisten through the heavy moisture; and far to the north Tenochtitlan is faintly perceptible to the naked eye. After leaving the summit at El Guarda, nearly 10,000 feet above sea level, the road rolls up and down and becomes narrow until a grove of pine trees is reached beyond El Marquez. From here, remnants of the old road are met with until the hill town of Huichiloque is in sight. After leaving this antique town, the road is spacious and well taken care of, but descends at a fearful rate until Cuernavaca is reached. The descent is 3,000 feet, and the time taken one hour.

The old road from Mexico to Zacatecas, Guadalajara, and San Luis Potosi, which extends to El Paso, or Ciudad Juarez, is still in existence, but is not maintained by the Government. The different district and State authorities keep it up for local traffic.

The road from San Luis Potosi, via Tula, to Victoria, the capital of Tamaulipas, has lately been repaired by the Federal Government. From San Luis Potosi to the approaches of Guadalcazar, the road is fair, and then the country is mostly rolling, and in some sections the road is very narrow, 3 to 4 meters (9.8 to 13 feet) wide. An appropriation of $10,000 was made more than nine months ago by the Oaxaca legislature toward completing the Oaxaca and Puerto Angel road. This is the south end of the original Tehuacan and Puerto Angel wagon road, which the Federal Government commenced many years ago. The Federal Government has abandoned its charge, and the Mexican Southern Railway will naturally supplant it for many years to come. From Puerto Angel to Pluma, a distance of 36 miles, this road is wide (20 meters=65 feet) and open; from Pluma to San Jose del Pacifico, a distance of 45 miles, the road begins to ascend rapidly, and the country assumes a rough appearance; the San Juan and Capalita rivers are crossed; then an ascent of 2,500 meters (8,135 feet) is made to the Cordilleras of Loxicha and beyond, on a slight descent, and 25 miles distant, the town of Miahuatlan is reached. The road follows the ridge above the Rio Verde, touching Ejutla and Ocotlan; then gradually descends, following the river, until Oaxaca is in sight, a distance of 75 miles and at an elevation of 1,544 meters (5,018 feet) above sea level. This road is considered as first class (by law, roads are first class when not less than 12 meters (39 feet) wide), and is one of the most important in the Republic, as it affords railway communications to Pochutla, Pluma, Juquila, and Miahuatlan, the best advanced and cultivated coffee district in Oaxaca.

Another road of importance is the one that connects Acapulco with Mexico City. From Puente de Ixtla, it follows the Amacusac River. After leaving the vallejo, this road ascends the Sierra Madre range, touching Tixtla, and then descends to the plains along the coast. This road is mostly rough and narrow.

There are other highways of less importance; among them, I may mention that of Guadalajara, via Sayula and Zapotlan.

STAGE LINES.

The old stage line, Empresa de Diligencias, 1ª de Independencia 76, City of Mexico, which has gradually been giving up its routes to the different railways since 1882, is still in existence. This line runs the best coaches and has well-fed stock. From Mexico City to Cuernavaca, the stage leaves Huipulco every Monday, Wednesday, and Friday; returning from Cuernavaca, it leaves Thursdays and Saturdays.

An opposition line, office 19 San José el Real street, leaves from the same place on Thursdays and Saturdays, returning from Cuernavaca on Mondays, Wednesdays, and Fridays. Stage connects at Gallejo, on the Mexican Central in Chihuahua, for Ascension, distance 187 miles, 35 hours, fare $15; starts on Mondays and Thursdays; starts also, on same days, for Casas Grandes, 90 miles, time 16 hours, fare $7.

Stages connect at Chihuahua with the Central for Guerrero, distance 185 miles, time 35 hours, fare $15, departing Mondays and Thursdays; for Cusihuiriachic, distance 70 miles, fare $10, time 14 hours, departing Mondays and Thursdays; for Rosario and Batopilas, distance 150 miles, time 25 hours; fare to Rosario $13, and to Batopilas $15; departing Mondays and Thursdays.

Stages leave the following places at the times specified:

Jimenez, for Allende and Parral, distance 62 miles, time 10 hours; fare to Allende $3.50, and to Parral $5, departing daily.

Simon, for San Juan de Guadalupe, State of Durango, distance 12½ miles, time 2 hours, fare 50 cents, departing daily.

San Bartolo, for Rio Verde, San Luis Potosi, distance 30 miles, time 5 hours, fare $2.50, departing Tuesdays and Fridays.

Zacatecas, for Jerez, distance 37 miles, time 5 hours, fare $1.25, departing daily.

Las Tablas, for Ciudad del Maiz, distance 30 miles, time 5 hours, fare $2, departing Wednesdays and Saturdays.

La Barca, for Zamora (Michoacan), distance 30 miles, time 5 hours, fare $2, departing daily excepting Sundays; for Atotonilco, distance 22½ miles, time 4 hours, fare $1, departure daily excepting Sundays.

Guadalajara, Jalisco, for Magdalena, distance 65 miles, time 24 hours, fare $4, departure Mondays and Thursdays; for Tepic, distance 150 miles, time 50 hours, fare $16, departure Mondays and Thursdays; for Mazatlan, distance 300 miles, time 100 hours, fare $30, departure Mondays and Thursdays; for Ameca, distance 60 miles, time 24 hours, fare $4, Mondays and Wednesdays; for Zapotlan, via Sayula, distance 120 miles, time 48 hours, fare $7, departure Mondays, Wednesdays, and Fridays.

Atequiza, for Chapala, distance 12½ miles, time 2 hours, fare $1, departure daily.

San Juan del Rio, Queretaro, for Cadereyta, distance 30 miles, time 4½ hours, fare $1, departure Mondays, Wednesdays, and Fridays.

Allende, on the International Railway, for Zaagoza, Coahuila, distance 12 miles, time 3 hours, fare $1.50, departure daily.

Sabinas, for San Juan de Sabinas, distance 15 miles, time 3 hours, fare $1.50, departure daily.

Telipe, for Juarez and Progreso, distance 30 miles, time 5 hours, fare $2.50, departure daily.

Barroteran, for Santa Rosa, distance 25 miles, time 4 hours, fare $2, departure daily.

Monclova, for Cuatro Cienegas, distance 47 miles, time 8 hours, fare $4; for Sierra Mojada, distance 155 miles, time 35 hours, fare $15, departure Mondays and Wednesdays.

Jaral, for Saltillo, distance 42 miles, time 7 hours, fare $3.75, departure daily.

Pailla, for Parral, distance 16 miles, time 3 hours, fare $2, departure daily.

Hornos, for Viesca and San Pedro, distance 15 miles, time 3 hours, fare $2, departure daily.

Jimulco, on the Mexican Central Railroad, for Corralitos and Tapias, departure Sundays, Wednesdays, and Fridays.

Stages connect with the Mexican Central Railroad at Fresnillo for Sombrerete, distance 65 miles, time 1 day, fare $4; at Zacatecas for Villa Nueva, distance 65 miles, time 12 hours, fare $1.25, departure daily; at Encarnacion, Jalisco, for Teocaltiche, distance 36 miles, time 7 hours, fare $2, departure daily; at Lagos for Ojuelos, distance 75 miles, time 1 day, fare $5, departure daily; at Leon, State of Guanajuato for Piedra Gorda, distance 54 miles, time 7 hours, fare $2, departure daily; at Silao for San Pedro (Piedra Gorda), distance 54 miles, time 1 day, fare $1, departure Tuesdays, Thursdays, and Saturdays; at Salamanca for El Valle de Santiago, distance 21 miles, time 2½ hours, fare 50 cents, departure daily; at Celaya for Cortazar, distance 16 miles, time 3 hours, fare 50 cents, departure daily; and for Santa Cruz, distance 22 miles, time 4 hours, fare 75 cents; at Queretaro for San Jose Iturbide, distance 42 miles, time 7 hours, fare $1.25, departure Mondays, Wednesdays, and Fridays; at Tula, Hidalgo, for Ixmiquelpan, distance 40 miles, time 8 hours, fare $3, departure Mondays, Wednesdays, and Fridays; and for Mixquahuala, distance 21 miles, time 4 hours, fare $1.50, departure Mondays, Wednesdays, and Fridays.

On the Sonora Railroad stages connect at Magdalena for Altar and Caborca; at Hermosillo, for Ures and Arizpe; and at Guaymas, for Alamos, Fuente, Sinaloa, and Mocorito.

THOS. T. CRITTENDEN,
Consul-General.

CITY OF MEXICO, *May 25, 1894.*

CENTRAL AMERICA.

GUATEMALA.

OCEAN LINES.

(1) Pacific Mail Steamship Company, a corporation of New York City; termini and main points, San Francisco, north, and Panama, south, touching at all Mexican and Central American ports, making 12 calls per month at all the principal ports; total length of line, 3,800 miles; condition of line, good; 14 vessels, averaging 3,000 tons, with an average horsepower of 600; rates for passengers, $75 in gold from San Francisco to Panama; for freight, $8 per ton from San Francisco to Panama; rates from San Francisco to New York, via Panama. for passengers (first class), $120 in gold; for freight, $18 per ton.

(2) New York, Belize and Central American Royal Mail Steamship Company, owned by British subjects; terminal points, New Orleans

and Puerto Cortez, Honduras, touching at principal points in British Honduras and Guatemala; total length of line, about 1,000 miles; 4 vessels, averaging 500 tons each, and 175 horsepower; passenger rates, $30 in gold to all points; freight rates, 50 cents per 100 pounds; one weekly trip each way.

RAILWAYS.

Guatemala Central Railroad, owned and controlled by an American corporation; termini, Guatemala City and San Jose; length of line, 75 miles; condition of line, good; single track, narrow gauge; one train each way daily; passenger fare, about 4 cents per mile in gold, first class; rates on freight vary according to bulk, weight, etc.; highest grade on this road is 3½ per cent.

D. LYNCH PRINGLE,
Consul-General.

GUATEMALA, *April 2, 1895.*

BRITISH HONDURAS.

OCEAN LINES.

The only mail steamship company that connects with this colony is the New Orleans and Belize Royal Mail and Central American Steamship Company. This line is under contract with the British Honduras Government. The company has five steamships owned and controlled in New Orleans. The line has been in existence for the last thirteen years, and, with the exception of one vessel, all are under the flag of the United States. The passage from New Orleans to this port is $25; freight rates average 75 cents per barrel.

The distance from New Orleans to this port is about 900 miles. The steamers leave New Orleans every Thursday morning, arriving in Belize every Monday morning, and leaving Belize the same afternoon for Stann Creek (40 miles) and Monkey River (84 miles). From Monkey River, the steamers proceed to Puerto Cortez, in Spanish Honduras, arriving there on Tuesdays; and leave that port at midnight for Livingston, Puerto Barrios, and San Tomas, in Guatemala. Returning to the colony, the steamers call at Punta Gorda, Monkey River, Settie River, Stann Creek, Mullens River, and Belize, clearing for New Orleans every Friday at 1 p. m.

The line is in first-class condition, as the vessels come under the United States inspection.

There is a line of steamers making irregular trips to this port from New York, controlled by James Rankin, 19 Whitehall street, New York.

The Harrison Line of steamers, clearing from Liverpool, call at this port about once a month. They also call at all West India ports; returning, they call at Mexican ports and then at New Orleans.

COAST LINES.

There is only one coast steamer, the American stern-wheel steamer *Freddie M.*, under contract with this Government to carry the mails to the northern part of the colony. She makes a trip once a week; distance, 136 miles.

RAILWAYS AND HIGHWAYS.

There are no railways in British Honduras.

There are no highways in the colony. Such "roads" as do exist are the old truck paths, which were used for hauling out timber.

There are no telegraphs in this colony.

JAMES LEITCH,
Consul.

BELIZE, *May 18, 1894.*

HONDURAS.

RAILWAYS.

In 1868 an English company having obtained a concession from the Government of Honduras for the construction of an interoceanic railroad from Puerto Cortez, the main port of entry on the north coast, to Amapala, the port of entry on the Pacific coast, commenced work at the former place. When 57 miles had been completed, the Government, unfortunately, authorized an issue of bonds. The company having sold $30,000,000 worth of the bonds, discontinued the work, and left the Government saddled with an enormous debt. Soon afterwards the bridge over the Chamelicon River was destroyed by a flood, thus rendering useless the 20 miles of road beyond San Pedro Sula. The 37 miles of road between this place and Puerto Cortez is all that the country can boast at present, though there is a prospect that the road will, before a great while, be continued to Comayagua and, later, to Amapala.

HIGHWAYS AND FREIGHTS.

The remaining highways of the country are cart roads and mule trails. In 1885–86, the following cart roads were constructed by the Government: (1) From San Lorenzo and La Brea to the capital, Tegucigalpa, a distance of 32 leagues (the league, as fixed by the laws of Honduras is, approximately, 2.6 English miles); (2) from Tegucigalpa to San Juancito, 7 leagues; (3) from Tegucigalpa to Yuscaran, 16 leagues; (4) from Tegucigalpa to Comayagua, 24 leagues, and Santa Barbara, 54 leagues In addition to these roads constructed by the Government are (5) a cart road from San Pedro Sula to Venado, a distance of about 12 leagues; (6) one from San Pedro Sula to Macuelizo, 20 leagues; and (7) a road from San Lorenzo to Choluteca. A road of about 12 leagues would connect No. 4 with either 5 or 6, thus giving a through cart road from San Pedro Sula to the capital.

All freight for Tegucigalpa, Comayagua, and the neighboring part of the country is brought in by way of Amapala. From this place it is carried by means of a steam tug and rowboats to San Lorenzo and La Brea, the depots on the mainland, each about 6 leagues from Amapala. From these points it is carried either on pack mules or in ox carts, the latter being used only for articles too large to be carried on mules. Travelers may reach the capital either by way of Amapala and San Lorenzo, or by way of Puerto Cortez and San Pedro Sula. The journey on mule back from San Lorenzo to Tegucigalpa requires about three days, and that from San Pedro Sula to Tegucigalpa, about seven days.

All goods having inland places for their destination should be packed so as not to weigh more than 130 pounds to the piece, as about 260 pounds constitutes a mule cargo. The cost, freight and agent's charges, on a cargo of 260 pounds, from Amapala to San Lorenzo, is 6 pesos ($2.73). The cost on cargo from San Lorenzo to Tegucigalpa is from 5½ to 10 pesos ($2.58 to $4.50), depending on the season. The cost on freight carried by carts, from San Lorenzo to Tegucigalpa, is from 1¼ to 1½ pesos (57 to 68 cents) for each arroba (25 pounds). Travelers making the trip from San Lorenzo to Tegucigalpa, have to pay about 8 pesos ($3.64) for a mule and 10 ($4.55) for the attending "mozo." The passenger fare over the railroad from Puerto Cortez to San Pedro Sula is 2½ pesos ($1.14), and the freight rate is 1 centavo (.0455 cent) a pound. Mules for making the trip from San Pedro Sula to Tegucigalpa can be hired for about 20 pesos ($9.10) each, and an attendant for about 15 pesos ($6.83). In addition to the charges mentioned, the traveler is expected to provide food for attendant and mules along the way.

The cart roads mentioned above are for the most part rough, mountainous roads, with many steep ascents and descents. Few of the swift mountain streams have bridges over them, and the crossing of some of them is, during the rainy season, often attended with difficulty and risk. The roads made by the Government were made under contracts providing that they should be 4 yards wide, or where the way had to be cut through rock, 2 yards wide. That portion of the Tegucigalpa and San Lorenzo road between Tegucigalpa and the mountain of Cerro de Hule, is a first-class highway, wide and smooth, and provided with excellent wooden and stone bridges.

WM. M. LITTLE,
Consul.

TEGUCIGALPA, *March 29, 1895.*

SALVADOR.

In compliance with Circular No. 150, I have the honor to report that there are no through lines of traffic in the Republic of Salvador.

ALEXANDER L. POLLOCK,
Consul.

SAN SALVADOR, *July 3, 1894.*

NICARAGUA.

All lines mentioned in this report are entirely controlled by either private corporations or individuals. With the exception of the steamships running between Philadelphia and Bluefields, all vessels mentioned herein carry the mails, and all carry freight. Many vessels mentioned are not advertised to carry passengers, but a limited number of passengers can be accommodated on any vessel mentioned in the report. The freight rates reported are those charged for carrying ordinary goods and merchandise.

The money referred to in the report is that of the United States.

OCEAN LINES.

San Juan del Norte and Bluefields are the only seaports in the consular district.

Four steamships run regularly between New Orleans and Bluefields, two sidewheel and two screw-wheel vessels, each steamship making the round trip in from sixteen to twenty days. The sidewheel vessels are run by the Southern Pacific Railway Company and are of 537 and 575 tons burden, respectively. The screw-wheel vessels have a tonnage of 362 and 496, respectively, and are run by the Bluefields Banana Company. Seven other screw-wheel steamships run regularly to Bluefields, four from Mobile and three from Philadelphia. The tonnage of these vessels is 323, 369, 448, 563, 321, 459, and 475, respectively. Each of the seven vessels makes the round trip in about twenty days. The speed of steamships running to Bluefields is from 9 to 12 miles an hour.

Passenger rates between New Orleans and Bluefields are $40 first class and $20 second class. Freight rates are $10 per ton, and 20 cents per cubic foot. The rates to and from Mobile are the same as the New Orleans rates. The consular agent at Bluefields has failed to obtain definite figures, but reports that the passenger and freight rates on the Philadelphia ships are a little higher than the New Orleans rates.

The Merchants' Line, of New York, has two screw-wheel iron steamships, of about 360 tons burden each, engaged in the San Juan del Norte and New York trade, each vessel making the round trip in twenty-eight days.

The Prince Line sends a screw-wheel iron steamship from New York to San Juan del Norte every twenty-eight days. The vessels sent by this line to San Juan del Norte are of about 2,000 tons burden. Their speed, like that of the Merchants' Line ships, is from 9 to 12 miles an hour.

Passengers and freight for San Juan del Norte are also carried on the Colombian Line steamships, one of which sails from New York to Colon every ten days. At Colon passengers and freight destined for San Juan del Norte are transferred to either the British Royal Mail or

the Colombian Steamship Company's vessels. Each of the two lines last mentioned has but one sailing a month from Colon to San Juan del Norte, and passengers from New York to San Juan del Norte via Colon should time their departure from New York so as to avoid unnecessary delay in Colon.

Passenger rates from New York to San Juan del Norte are from $60 to $75, first class, one line charging less than the others. Freight rates are from $8 to $10 per ton, and 20 cents per cubic foot.

Once a month a British Royal Mail steamship arrives at San Juan del Norte from England. These vessels first touch at Colon. They vary in size and speed, the same ship never making successive trips to San Juan del Norte.

Passenger rates between England and San Juan del Norte are $146.25 first class and $97.50 second class. Freight rates are from $7.30 to $11 per ton from England, and from $7.30 to $14.60 per ton to England.

A screw-wheel iron steamship of about 300 tons burden and 10 miles speed is run once a month to San Juan del Norte and Bluefields from Colon and ports farther south by the Caribbean Steamship Company.

From Colon to San Juan del Norte freight is carried for $5 to $10 per ton and cabin passengers for $15 to $23.20. Freight rates from San Juan del Norte to Bluefields are $5 per ton, and passenger rates are $6.

Owing to the bar at the mouth of the river, steamships can not enter the harbor at San Juan del Norte, and the landing of passengers and freight is effected by tug and scows respectively. Passengers are charged $1.25 each for passage on the tug. The lighterage charges are $2 to $3 per ton. Most of the freight and passenger business between San Juan del Norte and Bluefields is done by small sailing vessels of from 3 to 8 tons burden. These vessels carry passengers for $3 each, and ordinary bales and boxes for 50 cents a package.

RAILWAYS.

There are no railways in the consular district of San Juan del Norte. The Nicaragua Canal Company constructed a few miles of railway when the canal work was in progress, but the track is now overgrown with underbrush. In the Managua district there is combined railway and steam-vessel connection between Corinto, on the Pacific, and Granada, at the head of Lake Nicaragua.

NAVIGABLE RIVERS AND CANAL LINES.

A small stern-wheel steamer runs on the river between the towns of Rama and Bluefields, a distance of about 55 miles. The consular agent at Bluefields has not reported freight and passenger rates.

The Nicaragua Steam Navigation Company runs six steamers on the San Juan River, carrying from 30 to 100 tons of freight each. The same company runs a steamer of 125 tons burden and 9 miles speed on Lake Nicaragua. Two of the river boats are constructed of steel and

four of wood. The lake steamer is constructed of iron. Each is a stern-wheeler. The lake steamer makes but three trips a month between Granada and the foot of the lake. The small steamers are constantly employed on the river between the foot of the lake and San Juan del Norte carrying freight.

It takes from three to five days to make the run from San Juan del Norte to the foot of the lake.

Passenger rates between Granada and San Juan del Norte are $12.50 first class, and $5 second class. Freight rates are as follows: Wire, 50 cents per cwt.; flour, 40 cents per half barrel; kerosene, 50 cents per case of 10 gallons; ordinary freight, $12.50 per ton and 20 cents per cubic foot.

THOMAS O'HARA,
Consul.

SAN JUAN DEL NORTE, *January 1, 1894.*

NICARAGUA CANAL.

The proposition to build a ship canal across the Isthmus of Nicaragua, connecting the waters of the Atlantic and Pacific, may be said to have originated with the great explorer and scientist, Alexander von Humboldt, who expressed himself most favorably as to the advantages of the Nicaraguan route. Since Von Humboldt's time, various efforts have been made to undertake the work, but it was not until the Maritime Canal Company of Nicaragua obtained a concession from the Government of that country that it was actually begun. The company was chartered by act of Congress in 1889, and was organized May 4 of that year. The work of construction had already been commenced, and it continued until the summer of 1893, when it was suspended for want of funds. The termini of the canal are San Juan del Norte, or Greytown, on the Atlantic, and Brito on the Pacific. The length of the canal from port to port will be 169½ miles, of which 26¾ will be excavated channel and 143⅔ the improved navigation of rivers, lakes, and basins. The summit level is that of Lake Nicaragua, 110 feet above the sea. There will be three locks near either end. The water courses followed are those of the San Juan River and Lake Nicaragua.

The foregoing statements were compiled from the Handbook of Nicaragua, published by the Bureau of the American Republics in 1893, Chapter VI.

During the third session of the Fifty-third Congress (1895), action was taken for a United States Government survey of the canal by the insertion of the following in the sundry civil appropriation bill:

> For the purpose of ascertaining the feasibility, permanence, and cost of the construction and completion of Nicaragua Canal by the route contemplated and provided for by an act which passed the Senate January twenty-eighth, eighteen hundred and ninety-five, entitled "An act to amend the act entitled 'an act to incorporate the Maritime Canal Company of Nicaragua,' approved February twentieth, eighteen hundred and eighty-nine," twenty thousand dollars, to be expended under the direction of the Secretary of State.

And a board of three engineers is hereby constituted to make the survey and examination necessary for such ascertainment; said board to be selected and appointed by the President of the United States, one from the Corps of Engineers of the United States Army, one from the engineers of the Navy, and one from civil life; and the compensation of the members of said board shall be fixed by the President, not to exceed five thousand dollars each, including such pay as the engineers so selected are receiving, for the time they are so employed, from the Government. And the said board, under such arrangements and regulations as shall be made by the Secretary of State, with the approval of the President of the United States, shall visit and personally inspect the route of the said canal, examine and consider the plans, profiles, sections, prisms, and specifications for its various parts, and report thereon to the President; and should they ascertain that any deviation from the general line of the proposed route is desirable, they shall so state in their findings and conclusions with regard thereto in their report.

And said board shall make their report on or before November first, eighteen hundred and ninety-five.

COSTA RICA.

RAILWAYS.

There is but one railway in Costa Rica, the Costa Rican Railway, running from Port Limon to San Jose, the capital, and from San Jose to Alajuela, which is the terminus of the road in the interior. This railroad is controlled by a limited liability company in London.

The termini and main points touched, with distances apart, are as follows:

	Miles.
Limon to Matina	21½
Matina to Reventazon	17½
Reventazon to Cartago	51
Cartago to San Jose	14
San Jose to Heredia	6
Heredia to Alajuela	7
Total	117

The condition of the line is first class from Limon to San Jose, being a single-track line, steel rails throughout, and well ballasted; partly laid with steel ties. The section from San Jose to Alajuela is gradually being placed in the same excellent condition. The gauge is 3.6 feet.

In accordance with the terms of the concession, there is one train daily between San Jose and Limon, stopping at all stations. Between San Jose and Cartago and Alajuela there are three trains daily.

Rates for passengers are: First class, 8 cents; second class, 6 cents, Costa Rica currency, or, say, 3¼ cents and 2½ cents in gold, per mile, respectively.

The rate for freight is 20 cents, gold, per ton per mile, whether short or long haul.

The road from Limon to San Jose follows the Reventazon River for about half the distance, and the engineering difficulties were very great, but were overcome at much expense to the original projectors.

The road ascends from the sea level to an altitude of 4,997 feet at the highest point touched, between Cartago and San Jose; the capital being situated on the Pacific slope, though near the center of the Republic.

HIGHWAYS.

There is a road from Alajuela to Puntas Arenas, on the Pacific side, but it does not merit the name of a through line for traffic, being simply a first-class cart road.

HARRISON R. WILLIAMS,
Consul.

SAN JOSE, COSTA RICA, *January 1, 1894.*

WEST INDIES.

No reports in response to the Department circular having been received from the West India Islands, the following information has been compiled from Special Consular Reports "Streets and Highways," from the monthly issues of Consular Reports, and from other sources indicated in footnotes or in the body of the text.

BAHAMAS.

Consul McLain, of Nassau, reported to the Department November 28, 1890:

"The Bahama Islands are composed of coralline limestone, and the surface of this natural rock forms the street or roadway. There is no depth of soil, the rock itself being often fully exposed to view. All that is done to construct a street or roadway is to remove such sparse brush or chaparal as may be growing thereon (the rock itself being so porous and full of crevices and fertilizing elements as to sustain considerable vegetable growth with little, if any, soil), smooth down any sharp projections of rock, and fill up depressions with small pieces of the broken stone. As a result you have a reasonably smooth roadway of solid stone, which will meet all the requirements of the people.

"In the outlying islands of the colony there are comparatively few roads, and such as exist are little more than pathways cut through the bush, wide enough to permit the passage of a single two-wheeled farm cart, which is about the only vehicle in use. The fact that the islands are generally of considerable length and narrow renders roadways less necessary, the people owning their boats and passing easily from point to point along the shore.

"In the island of New Providence, whereon is situated the capital, the city of Nassau, a town of about 12,000 inhabitants, more attention

is paid to streets and roadways, but here, as elsewhere, the solid rock forms the street or road.

"The original cost of the streets is not great, as there are no difficult problems of grade, sewerage, or engineering, and the cheapest and rudest form of labor is used in their construction. There are few streams or ravines requiring culverts or bridges.

"No obstruction to uninterrupted travel ever arises from the wet or muddy condition of streets or roads in the Bahamas, since the soil, where any exists, is too thin and sandy to retain water, and the bed-rock is so porous as to absorb within a few hours the heaviest tropical downpour of rain.

"The extent of streets in Nassau is about the same as is found in towns of the same population in the United States; while the total length of the roadways, under public control, on the island of New Providence, outside of this city and its immediate suburbs, I should estimate as not to exceed 45 or 50 miles.

"The island itself is about 20 miles in length, with an average width of perhaps 5 miles. Two years ago there was less than one-third of the island under cultivation and hence no great need for country roads; but now large tracts are being planted in sisal, for the production of fiber, and new roads are being projected and will shortly be built in all parts of the interior. They will all be of the same general character as those now in existence, and will be easily and cheaply made."

OCEAN LINES.

Under date of October 2, 1893, Consul McLain wrote that goods reached the Bahamas from the United States by means of sailing vessels and steamers—almost entirely by means of the latter. Nine-tenths of these goods are shipped from New York and are subjected to no handling until they reach Nassau. The goods are, for the most part, landed from the vessels at the wharves, the remainder being discharged into lighters outside the bar and conveyed thence to the wharves. Warehouses are provided. Those goods destined for any of the outlying islands are conveyed thither in small schooners.

In a report dated December 29, 1893, Consul McLain adds:

"Shipping facilities from the United States are good. Three steamers leave New York for this port and return during each month. The time of passage is from three and a half to five days. Occasional sailing vessels are also going to and fro between this port and several American ports."

BERMUDA.[1]

Consul Grout, August 19, 1893:

"The people of Bermuda are obliged, on account of the geographical position of the islands, if for no other reason, to depend upon the United States for almost all their supplies. The United States furnish at least two-thirds of the goods consumed. The remainder is brought from England.

"Goods reach Bermuda from the United States by sailing vessel or steamer direct and are subject to no extra handling from the time of departure until arrival.

"There are only two ports of entry—St. George and Hamilton. The latter is the principal one and by far the more preferable, on account of the superior dock facilities provided by the port corporation.

"At the present time there is but one regular line of steamers running between New York and Bermuda (those of the Quebec Steamship Company). The steamers of this line leave New York and arrive directly at the dock at Hamilton, where goods are landed under sheds of ample capacity, well protected from the weather. The time occupied in transit is usually about three days, and, owing to increasing business and harbor improvements now under contract, this company contemplates putting on faster steamers.

"Bermuda comprises various divisions or 'parishes,' including several islands connected by bridges with the main body. Goods destined for any of these divisions outside of Hamilton are reshipped on large sailing boats or transported by drays, in either case the form of outside covering being the same as when received at the dock."

CUBA.

Consul-General Williams, Havana, September 20, 1893:

"Goods are brought here from the United States either in sailing vessels or steamships. After being loaded in the United States they are not subjected to any further handling until they reach this port.

"All goods are forwarded to the interior by railways or coasting vessels and are given good handling and usage en route. From the railway in the interior and from the wharves at the outports, they are transferred to the distributing centers, generally in carts drawn by oxen or mules. In this part of the island pack horses and porters are but little used for this purpose."

---

[1] According to the Statesman's Year Book for 1895, there are 32 miles of telegraph wire and 15 of cable in the Bermudas. A cable connecting the island with Halifax, Nova Scotia, was laid in July, 1890.

Consul Cheney, of Matanzas, October 29, 1893:

"Goods reach this district almost entirely by steamship from New York, Tampa, New Orleans, or Pensacola. They are not liable to any other handling or usage than that which is common to all regular steamship routes. On all these routes American goods are handled with ordinary care, and, when properly packed, are little liable to injury except in extraordinary weather.

"As in most Cuban ports, for want of sufficient depth of water at the wharves, steamers anchor in the bay, half a mile or more away, and discharge by means of lighters. This, of course, adds somewhat to the danger of damage by handling and weather, especially as the laborers employed in the transfer are not always the most intelligent and careful.

"As a rule, goods are shipped to the interior by rail. They are liable to go from this port and from distributing points in the interior short distances by pack mules. Generally speaking, there are no roads, other than the railroad and the mule paths, and wagons such as do the transportation in the towns in the United States away from railroads are unknown. It is scarcely necessary to have regard for either size or shape of packages liable to transportation by mules. They carry almost anything that can be carried by any means of transportation and with safety. It is only necessary to keep in mind that the limit of a mule's load is 400 pounds, which must be divided and carried half on each side. The limit of the weight of packages is therefore 200 pounds."

OCEAN LINES.

Havana is connected by regular lines of steamers with United States and Spanish ports. Lines of steamboats connect at Tampa and Pensacola, Fla., with the Florida railroads, and by means of them with the various railroad systems of the United States. The lines sailing from New York are:

New York and Cuba Mail Steamship Company, for Havana every Wednesday and Saturday; for Tampico every Wednesday. Steamers *Seguranca*, Havana and Mexican ports; *Saratoga*, Havana and Tampico; *Seneca*, Havana and Mexican ports. For Nassau, Santiago, and Cienfuegos, via Guantanamo, every alternate Thursday. Steamer *Santiago*. Jas. E. Ward & Co., agents, 113 Wall street, New York.

Munson Steamship Line from New York for Matanzas, Cardenas, and Sagua. Steamers *Ardanmhor*, *Ardanrose*, and *Ardandhu*. Also from Philadelphia for Havana, Tampico, and Vera Cruz. Steamer *Vittoria*. W. D. Munson, 80 Wall street, New York.

Campania Trasatlántica Española (formerly A. Lopez & Co. North American Branch). The steamers of the Spanish Steamship Line, under contract with the Spanish Government, leave New York for Havana direct on the 10th, 20th, and 30th of every month. J. M. Ceballos & Co., agents, pier 10, East River.

Bea Bellido & Co. line of steamers for Matanzas, Cardenas, Sagua, and Caibarien. Waydell & Co., 21 Old Slip.

Regular Line for Guantanamo, Santiago, and Cienfuegos. Steamer *Ardangorm*. Waydell & Co., 21 Old Slip.

Return of foreign shipping in the port of Havana during the year 1893. *

Nationality.	Steamers.	Barks.	Barkentines.	Schooners.	Total.	Tonnage.
American	392	31	18	115	556	631,958
Spanish	327	59	29	4	419	666,601
French	32	1	.....	.....	33	78,590
German	32	1	.....	.....	33	45,685
Dutch	2	.....	.....	.....	2	189
Norwegian	35	9	1	.....	45	25,345
Italian	.....	6	3	.....	9	4,470
Russian	.....	.....	.....	1	1	314
Total	820	107	51	120	1,098	1,453,152

* Report of British consul-general at Havana, March 31 1894.

RAILROADS, TELEGRAPHS, ETC.[1]

Much progress has been made of late years in opening up the country and developing its agricultural resources with railroads.

There are now upward of 1,000 miles of main line belonging to the railway companies, and all the larger sugar estates have private lines connecting them with the main lines.

There are ten railway companies in Cuba, the most important being the Ferrocarriles Unidos.

The Ferrocarriles Unidos Company have four lines connecting Havana respectively with Matanzas, Batabano, Union, and Guanajay. The lines pass through the most populated part of the country and connect Havana with the other lines in this part of Cuba.

The Western Railway was commenced about forty years ago, and in 1891, the year when it was acquired by an English company, had reached Puerte de Golpe, a distance of 96 miles from Havana, and 10 miles from Pinar del Rio, the capital of the Province of that name and place of residence of the authorities, as well as being the center of the tobacco-growing district. The line was at this time in very bad order. The new company lost no time in beginning the extension, and great exertions have successfully been made to reach Pinar del Rio this spring. Great improvements have also been made in the old part of the line. Many of the bridges have been replaced by modern steel ones, and a great part of the rails has been entirely renewed. New and comfortable carriages have been put on the line and the daily trains run with punctuality. There is no doubt that the extension of the line will be of the greatest importance to the western provinces of Cuba, opening up the rich tobacco district of Vuelta Abajo, and bringing into touch some of the finest land in the island, which has as yet been retarded by want of easy communication with the ports. There is already talk of extending the line farther westward.

[1] Extracts from report of British consul-general at Havana, March 31, 1894.

The other railway companies are as follows: Ferrocarriles Cardenas-Jacaro, the main line of which joins the towns of Cardenas and Santa Clara; Ferrocarril de Matanzas, having lines between Matanzas and Murga, and also between Matanzas and Guareiras; Ferrocarril de Sagua la Grande, running between Concha and Cruces; Ferrocarril Cienfuegos-Santa Clara, connecting these towns; Ferrocarriles Unidos de Caibarien, from Caibarien to Placetas; Ferrocarril de Puerto Principe-Nuevitas; Ferrocarril de Guantanamo.

Ferrocarril de Marianao (the Marianao Railway) also belongs to an English company, with headquarters in London; the whole of the stock, including debentures, being in English hands. The original line was opened to the public in 1863, and belonged to a Cuban company, but having got into difficulties they liquidated and transferred their interests to the present proprietors. The line is only $8\frac{1}{2}$ miles in length and runs between Havana and Marianao, with a branch line to a small village on the coast, which was opened to the public in 1883. During the last year, over 750,000 passengers were carried, passenger traffic being the principal source of revenue. The carriages are of the American type and are fitted, as well as the locomotives, with the Westinghouse automatic brake; the rails are of steel, weighing 60 pounds per yard.

The national carriage is the volante, and no other is used in the country in Cuba. It consists of a two-seated carriage in the form of an old English buggy, slung rather low down by leather straps from the axle of two very large wheels, and has shafts 15 feet long. The horse in the shaft is led by a postilion, whose horse is also harnessed to the carriage with traces. In the case of a long and rough journey, a third horse is harnessed on the other side of the shafts in the same manner. The carriage is extremely comfortable to travel in, and the great height of the wheels and their distance apart prevents all danger of turning over, although the roads in the country are, for the most part, mere tracks through fields and open land.

There are four ocean telegraph cables connected with Cuba. They are as follows:

The International Ocean Telegraph Company has a cable from Havana to Florida in connection with the United States Western Union Telegraph Company.

The Cuban Submarine Telegraph Company, Limited, has a cable connecting Havana with Santiago de Cuba and Cienfuegos.

The West India and Panama Telegraph Company has a cable connecting Havana with Santiago de Cuba, Jamaica, Puerto Rico, the Lesser Antilles, and the Isthmus of Panama.

The Compagnie Française de Câbles Sous-Marins has a cable connecting Havana with Santiago de Cuba, Haiti, Santo Domingo, Venezuela, and Brazil.

The only three towns in Cuba having cable connections are Havana, Cienfuegos, and Santiago de Cuba.

The telegraph system in Cuba is in the hands of the Government. There are wires connecting all the towns and villages in the islands.

The telephone system in Havana also belongs to the Government, but is farmed out for a limited number of years to a company called the Red Telefonica de la Habana. Nearly all the public and private buildings in the city and suburbs are connected by telephone.

HAITI.

Consul-General Durham, Port au Prince, August 29, 1893:

"Goods reach this island by steamers and sailing vessels. Goods from steamers are landed from lighters. Sailing vessels generally dock at the custom-house wharf. Ample warehouses are provided. They are well roofed, but the walls, being arranged for free ventilation, necessary in this climate, expose goods to driving rains.

"Transshipments to the interior are generally made by pack mules. This, however, does not affect the manner of packing of goods in the United States, for merchandise rarely goes to the interior in original packages."

According to the Handbook of Haiti, issued in 1893 by the Bureau of the American Republics, Haiti has eleven ports open to foreign commerce, viz: Cape Haitien, Port de Paix, Gonaives, St. Marc, Port au Prince, Petit Goave, Miragoane, St. Jeremie, Aux Cayes, Aqui, and Jacmel. Besides a number of sailing vessels, there are lines of steamers running to New York, to European ports, to Mexico, Central American ports, Colombia, Venezuela, and various islands of the Antilles. Haiti is a member of the Universal Postal Union, and is connected by cable with the outside world. She has also an inland postal service, and lines of telegraph are being built to connect her cities and towns.

The roads in the interior are little more than mule paths, the highways built by the French having become impaired by neglect and the effects of the heavy rains. The common method of traveling in the interior is on the backs of horses, donkeys, and mules.

There are no railroads in Haiti, but four lines have been projected, viz: (1) From Port de Paix to Gros Morne; (2) from the Grand Saline through the plain of Artibonite; (3) from Cape Haitien to Onaminthe; (4) from Port au Prince to the lakes through the Plaine du Cul de Sac.

SANTO DOMINGO.

The Handbook of Santo Domingo, published by the Bureau of the American Republics, in March, 1894, states that there is but one line of railroad in operation in Santo Domingo—from La Vega to Sanchez, on the Bay of Samana, 62 miles in length, 3½ feet gauge. Another line,

in course of construction, will connect the city of Santo Domingo with Azua, passing through San Cristobal and Bani, a distance of 90 miles. Lines have been projected (1) from Barahma, via Neyba and San Juan, to the Bay of Manzanillo, 186 miles; (2) Dominican Eastern Railway, from La Romana, a seaport 65 miles east of Santo Domingo, to San Lorenzo, on the Bay of Samana, via Leybo, length 200 miles, gauge 3½ feet; (3) Central Santo Domingo Railway, from Puerto Plata, on the north coast, to Santiago, 49 miles, with an extension to the city of Santo Domingo, making the total length 155 miles.

At the end of 1890 there were 294 miles of telegraph, with communication with the cable systems of the world.

Steamers engaged in the West India trade call at Puerto Plata and other points.

PUERTO RICO.

Consul Stewart, San Juan, December 30, 1890:

"In the entire island there are about 150 miles of excellent road, and of this alone it is necessary to speak, since this is all that receives any attention. In its construction a level foundation is sought, and upon this is put a heavy layer of crushed rock and brick, which, after having been well packed and rounded, is covered with a layer of earth. This is then well packed also, and upon the whole is spread a layer of ground limestone, which is pressed and rolled until it forms almost a glossy surface. This makes an excellent road here, where the climate is such that it does not affect it, and where there is no heavy traffic; but these conditions being changed, the road, it is thought, would not stand so well; hence, further particulars are deemed useless."

According to the Statesman's Year Book for 1895, there are 12 miles of railway and 470 miles of telegraph in Puerto Rico.

JAMAICA.

The island of Jamaica in 1893[1] had 119½ miles of railway open, and 700 miles of telegraph lines.

Consul Estes, Kingston, December 9, 1890:

"The Macadam system of road building is used altogether on the streets and 'Government roads,' as the main highways are called, and on the best of the byroads in the plains, but the mountain 'parochial roads,' usually little better than mere trails or bridle paths, are left to the tender mercies of heavy rains and unskilled labor to a great extent and are far from worthy of any extended notice in this report.

"The same system, however, that leads to cut up and dusty streets during the dry season and to flowing rivulets of mud and water in the

---

[1] Statesman's Year Book, 1895.

wet season, under the heavy hauling in some parts of Kingston, yields most excellent driving roads in the outskirts of the city and main highways, far above the average in the Western Hemisphere, in the country.

"The stage routes throughout Jamaica, though used by the peasantry to an unusual degree, are in many places quite equal to many of the trotting tracks of the United States in smoothness of surface and elasticity."

Consul Eckford, Kingston, January 15, 1894:

"The shipping facilities from the United States to this island are excellent. One steamship company runs regularly bimonthly and sometimes weekly steamers from New York to this port, while there are numerous 'tramp' steamers. From the outports on the north side of the island there is semiweekly communication either with Boston, Baltimore, Philadelphia, or some other port. Sailing vessels are also constantly plying from this city and the outports of the island to the principal ports of the United States."

SOUTH AMERICA.

INTERCONTINENTAL RAILWAY.

The project of an intercontinental railway to connect the countries of North and South America took definite shape in the appointment in 1890 of an international commission representing the United States, Mexico, Guatemala, Salvador, Colombia, Brazil, Venezuela, Ecuador, Peru, the Argentine Republic, Uruguay, and Paraguay. The executive committee made a preliminary report January 31, 1893, giving the results of surveys made by the commission's engineers. These surveys, according to the following information, which was given to the public June 20, 1895, have already been utilized in determining the location of certain links in the proposed system:

"The Guatemala Central Railroad Company, whose main line runs from San Jose, on the Pacific, to Guatemala City, has determined to build that portion of the intercontinental system intended to traverse Guatemala, and has put that determination into practicable shape by actual construction, having opened to traffic on April 14 last the section extending from Santa Maria, on the Guatemala Central, to Santa Lucia, and is continuing the construction to Patulul with the intention of continuing the line northwestwardly to the Mexican frontier and southeastwardly to the frontier of Salvador. The roadbed and bridges of this line are being constructed on the standard gauge, although the track to be adopted at first is 3 feet. This road is being substantially built, the bridges being of steel with stone abutments, and the track already laid being steel rails of 54 pounds. The Mexican Southern Railroad is already in operation to Oaxaca, 400 miles south of the City of Mexico, and will soon close the intervening gap between that city and the Guatemala frontier. The Mexican Southern and the Guatemala Central will soon enable one to go by rail from Washington to the frontier of Salvador. In this latter Republic Mr. Scherzer is at work constructing his line, and it, taken in connection with the railroads already existing in Nicaragua, would enable travelers to go by rail from any city in the United States to the proposed location of the Nicaragua Canal."

Concessions have been granted for a line from the southern shore of Lake Nicaragua through Costa Rica, and this road, it is thought, will

be built. The line through Central America surveyed for the commission, however, runs generally along the Pacific slope from the northwestern portion of Guatemala to the city of Panama. In Colombia the route has two arms, one from Panama and the other from Cartagena, on the Caribbean Sea, to a point south of Medellin. At Medellin a line branches off to Venezuela. The Panama and Cartagena lines unite below Medellin and form a single route through Ecuador, touching the capital, Quito, and through Peru to Cuzco. The line continues along the western and southern shores of Lake Titicaca to La Paz, the capital of Bolivia. Between La Paz and Huanchaca a railroad is already in operation for more than half the distance (Oruro to Huanchaca). From Huanchaca three routes diverge, one a continuation of the great north and south trunk line to Jujuy, in the Argentine Republic, already connected by railroad with Buenos Ayres; another eastwardly, through Bolivia and Brazil, to Rio de Janeiro; and the third branching off from the Brazilian route at Pomobamba and running in a general southeast course through Paraguay to Asuncion. The Oruro Railroad already connects Huanchaca with the port of Antofagasta, Chile.

COLOMBIA.

OCEAN LINES.

The port of Panama, situated on the west side of the bay of that name, and located at one of the most interesting geographical positions in the Americas, if not of the world, is of the greatest importance. It is, so to speak, a halfway station on the highway of commerce between Europe and Asia; yet it has no direct line to the Asiatic ports. By the way of Colon and the Panama Railroad it is connected with Europe and with the eastern part of the United States by many steamship lines, to wit: The Royal Mail Steamship Company (mail line, British); The Royal Mail Steamship Company (cargo line, British); Compagnie Générale Transatlantique, of Saint-Nazaire (French); Compagnie Générale Transatlantique, of Havre and Bordeaux (French); Compagnie Générale Transatlantique, of Marseilles (French); West Indies and Pacific Steamship Company, of Liverpool (British); The Harrison Line, of Liverpool (British); Hamburg-American Packet Company, of Havre and Hamburg (German); The Colombian Line, of New York (old Pacific Mail Steamship Company, United States); Compañía Transatlántica, of Barcelona (Spanish); The Italian Line, of Genoa (Italian). The fleets of these companies aggregate some sixty-five vessels, some of which are among the finest sailing across the ocean.

If the capitalists of the Republic of Colombia were to establish a direct line of steamers from Panama to Asia, by the way of Samoa or the Sandwich Islands, it would undoubtedly be the most important

highway of commerce in the world, and I dare say a favorable concession could be secured from this Government by any company that would see fit to inaugurate such a line.

From Panama south there are two ocean lines, viz., the South American Steamship Company and the Pacific Steam Navigation Company; northward, there are the Pacific Mail Steamship Company and the North American Navigation Company.

South American Steamship Company.—This company has steamers leaving this port every other week bound for Chile, the termini being Panama and Valparaiso, a distance of something over 3,000 miles. The itinerary of the line is as follows: Buenaventura, Tumaco, Esmeraldas, Bahia, Manta, Cayo, Ballenita, Guayaquil, Tumbes, Payta, Techura, Pimentel, Eten, Pacasmayo, Selaverry, Chimbote, Samanco, Casma, Huarmey, Supe, Huacho, Callao, Corro Azul, Tambo de Mora, Pisco, Lomas, Chala, Quilca, Mollendo, Ilo, Arica, Iquique, Tocopacilla, Tobija, Antofagasta, Taltal, Chanaral, Caldera, Carrizal Bajo, Huasco, Coquimbo, Valparaiso. The steamers of this line call at all of these places. The regular ports of call for the largest steamers are Guayaquil, Techura, Pimentel, Callao, Mollendo, Iquique, and Coquimbo. The distance from Panama to Guayaquil is 800 miles; from Guayaquil to Callao, 600 miles; from Callao to Iquique, 650 miles; and from Iquique to Valparaiso, 800 miles. This company secures its coal from Corral, some 400 miles south of Valparaiso, where splendid coal deposits are found.

The fleet of this line is composed of the following vessels:

Steamers.	Tonnage capacity.	Horse-power.	Steamers.	Tonnage capacity.	Horse-power.
Aconcagua	3,000	3,100	Limari	900	650
Imperial	3 000	3,000	Chillan	600	450
Mapocho	3,000	3,000	Biobio	600	400
Maipo	2,950	2,000	Spartan	600	400
Cachapoal	2,755	1,900	Aquila	600	400
Lantaro	2,600	1,600	Lircai	600	400
Amazones	2,500	1,800	Longavi	400	370
Itata	2,600	1,500	Maule	250	240
Copiapo	1,800	1,900	Pudeto	300	230

Only the largest of these vessels come to this port, viz, the *Aconcagua*, *Imperial*, *Mapocho*, *Maipo*, and *Cachapoal*. The other steamers, especially the small ones, do coastwise service and ascend the rivers as far as possible; so that, from Valparaiso to Panama, there is not a port of importance in Chile, Peru, and Ecuador that can not be reached by one of these vessels.

The passenger (first class) rates are: From Panama to Guayaquil, £13 15s. ($66.81); from Guayaquil to Callao, £20 ($97.32); from Callao to Valparaiso, £11 17s. 6d. ($57.79); from Panama to Valparaiso, £31 17s. 6d. ($154.63).

The rates to all intermediate points are somewhat proportional to distances. The passenger traffic is considerable both ways.

The rates of freight per ton are: Panama to Guayaquil and Techura, inclusive, 21.25 sols[1] ($19.38); Panama to Pimentel and Huacho, inclusive, 25 sols ($22.80); Panama to Callao and Valparaiso, inclusive, 27 sols ($24.62).

The quantity of freight carried during the year 1893, from Panama to all ports south, was 14,400 tons; the quantity brought from all ports south to Panama was 8,660 tons; from Panama to Guayaquil, 10,000 tons; from Peruvian ports to Panama, 1,000 tons; from Panama to Peruvian ports, 2,500 tons.

The treasure brought from the south by this line for Central America, New York, and Europe, during the year 1893, amounted to $2,200,000. The different staples which go to make up cargoes from the south are cacao, coffee, hides, rubber, cacao leaves, hay, vegetables, etc.; the cargoes south are general merchandise and manufactured products from the United States and Europe—principally from Europe.

The line is controlled by Chilean capitalists. The general agent in Panama, to whom all communications for inquiry can be sent, is Henry Ehrman.

The Pacific Steam Navigation Company.—This is an English corporation (limited), with headquarters in Liverpool. It runs steamers all over the world but has a distinct line doing service with Valparaiso, from which port it runs a special line of steamers to Panama. The fleet is composed as follows:

Steamers.	Tonnage capacity.	Horse-power.	Steamers.	Tonnage capacity.	Horse-power.
Arequipa	3,190	2,600	Pizarro	2,160	1,900
Bolivia	1,925	1,800	Quito	1,266	1,100
Coquimbo	1,821	1,600	Santiago	3,190	2,800
Casma	592	450	Serena	2,394	2,100
Manavi	1,041	900	Morro	170	150
Puno	2,398	2,200			

These steamers make trips fortnightly regularly, and work somewhat in conjunction with the South American Steamship Company, although they are distinct lines under different managements. There was a time, not so very long ago, when they ran a powerful competition, but they have pooled their issues.

The termini of this particular line are Valparaiso and Panama, but it runs a steamer regularly to Puntas Arenas and back, principally for the cattle business. The itinerary of this company is identical with that of the South American Steamship Company. The rates for passengers (first class) from Valparaiso to this place and intermediate points, and vice versa, are identical with those of the same company, as are their rates of freight.

The tonnage carried by this line during the year 1893, from Valparaiso to Panama and back, amounted to about 50,000 tons. The

[1] The consul-general values the sol at 91.2 cents.

staples composing the cargoes are the same as those carried by the South American Steamship Company, with the exception that it carries more European goods.

The treasure carried by this line during 1893 amounted to some $3,000,000, consigned to parties in Central America and New York.

This company owns in the bay of Panama an island called the Little Taboga, leased from the owner for a number of years. On this island they have waterworks which furnish them all the needed water (spring) for their steamers. They maintain in this bay a small steamer called the *Morro*, of 170 tons, to supply their vessels with water. This lease is exceedingly valuable, as the water is excellent, and so far as known the only spring water in this part of the world.

North American Navigation Company.—This company has a fleet composed of the following vessels:

Steamers.	Tonnage capacity.	Horse-power.
St. Paul	606.61	400
Mexico	1,240.72	700
Keweenaw	2,511.40	2,000
Saturn	2,268.15	1,900
Progreso	1,919.13	1,700

This company was organized early in 1893, in San Francisco, by some of the leading merchants of that place, in opposition to the Pacific Mail Steamship Company. It operates in conjunction with the Panama Railroad, through bills of lading being given from San Francisco direct to New York, via Panama and Colon, and vice versa. All the vessels are chartered from eastern parties for the term of one year, and the line is controlled by Capt. W. L. Merry, president of the company, with general offices in San Francisco.

It has no accommodations for passengers (first class), and does not pretend to carry any, unless upon exceptional occasions, and then only as deck passengers. It carries, however, a large amount of freight, both from San Francisco to Panama, and vice versa. It broke the monopoly which the Pacific Mail Steamship Company had enjoyed on this coast for many years. The gross tonnage of this line, both ways, amounts to some 60,000 tons. The trips are somewhat irregular, there being no fixed dates for arrivals or departures; but so far, they have averaged two trips per month each way. The rates of freight, owing to the competition with the Pacific Mail Steamship Company, are very low and irregular; they charge what they can get, sometimes less than a cent per pound, often only $2 per ton.

The ships of the North American Navigation Company make the trips direct from here to San Francisco and return, calling on rare occasions at Mexican and Central American ports. The distance from San Francisco to Panama is 3,940 miles.

The Pacific Mail Steamship Company.—This company has been supplying service between San Francisco, the Isthmus, and New York, for nearly half a century. It is not as powerful in these regions as it once was, but promises, ere long, if all signs do not fail, to more than regain its former usefulness and greatness. It is doubtful, however, if it will ever have a foothold south of Panama, nor does it seem to care for any; in fact, it has not protected its own coastwise trade north of Panama, as it has allowed the Pacific Steam Navigation Company (British) to encroach on its domain, that line now having a steamer doing service at the expense of the Pacific Mail as far north as Puntas Arenas, in Costa Rica. This service promises not to stop there, and it would not be surprising to see the Pacific Steam Navigation Company steam all the way to San Francisco, unless the Pacific Mail gives much better service than it now gives.

The fleet of the Pacific Mail Steamship Company on this route consists of the following vessels:

Steamers.	Tonnage capacity.	Horse-power.	Steamers.	Tonnage capacity.	Horse power.
Colon	1,843.50	1,700	City of Sydney	1,965.88	1,800
San Jose	1,538.25	1,450.50	Costa Rica	1,166.80	900
Acapulco	1,759.24	1,600	Starbuck	1,548.41	1,000
San Blas	1,496.50	1,300	City of Panama	1,046.30	800
San Juan	1,496.50	1,350	Barracouta (British)	1,659	1,400
Colima	2,143.23	2,000			

The four last ones are doing coasting service as far up as Acapulco; they do not go to San Francisco. The itinerary of the company is as follows: Puntas Arenas, San Jose del Sur, Corinto, Amapala, La Union, La Libertad, Acajutla, San Jose de Guatemala, Champerico, Ocos, San Benito, Tonala, Salina Cruz, Puerto Angel, Acapulco, Manzanillo, San Blas, Mazatlan, and San Francisco.

The main points and their distances from Panama are: Corinto, 740 miles; San Jose de Guatemala, 990; Acapulco, 1,590; Manzanillo, 2,140; San Blas, 2,225. The distance between Panama and San Francisco is 3,920 miles.

When the coffee ceases to move, one of the coasters is withdrawn from the route, and it then serves as a coal ship in the bay of Panama.

The *Barracouta* sails under the English flag.

Three steamers leave San Francisco for Panama, on the 8th, 18th, and 28th of each month; they return from Panama to San Francisco on the 9th, 19th, and 29th of each month. The coasters leave Panama on the 10th and 29th of each month, and they aim to make about one trip per month, for each vessel, but this is not very regular, owing to the difficulties in loading and unloading at the different places in Central America and Mexico, the system of lighterage being in vogue at almost all these ports, there being no piers.

The rates, in American dollars, for passengers (first class) from Panama are: To San Francisco, $100; to Puntas Arenas, $20; Puntas Arenas

to San Juan, $10; San Juan to Corinto, $5; Corinto to Amapala, $5; Amapala to La Union, $5; La Union to La Libertad, $5; La Libertad to Acajutla, $5; Acajutla to San Jose, $5; San Jose to Champerico, $5; Champerico to Ocos, $5; Ocos to San Benito, $5; San Benito to Tonala, $5; Tonala to Salina Cruz, $5; Salina Cruz to Puerto Angel, $5; Puerto Angel to Acapulco, $10; Acapulco to Manzanillo, $10; Manzanillo to San Blas, $5; San Blas to Mazatlan, $5; Mazatlan to San Francisco, $45.

The rates of freight for treasure from Panama to all ports in Central America and Mexico is three-fourths of 1 per cent; from Panama, on sums of $10,000 or more to one consignee, five-eighths of 1 per cent; between the ports of Central America, three-eighths of 1 per cent; between the ports of Central America and Mexico, one-half of 1 per cent; between Acapulco and the Mexican ports to the north, three-eighths of 1 per cent; between Acapulo and the Mexican ports south, three-eighths of 1 per cent; and between the Mexican ports south of Acapulco and those north, one-half of 1 per cent.

The rates of freight on cotton from Acapulco to Manzanillo, San Blas, and Mazatlan, are three-fourths of 1 cent per pound. All these sums are payable in United States coin, and in advance.

The rates on all freights per ton, or per 40 cubic feet, are, for long haul and short haul, as per following table:

From—	To—																
	Puntas Arenas.	San Juan.	Corinto.	Amapala.	La Union.	La Libertad.	Acajutla.	San Jose.	Champerico.	Ocos.	San Benito.	Tonala.	Salina Cruz.	Puerto Angel.	Acapulco.	Manzanillo.	San Blas.	Mazatlan.
Panama	$7	$9	$9	$9	$9	$10	$10	$10	$10	$11	$12	$14	$14	$14	$14	$16	$16	$16
Puntas Arenas	....	5	5	6	6	6	6	6	7	8	10	10	10	10	10	12	12	12
San Juan del Sur	....	....	4	4	4	5	5	5	7	8	10	10	10	10	10	12	12	12
Corinto	....	....	....	3	3	4	4	5	7	8	10	10	10	10	10	12	12	12
Amapala	....	....	....	....	3	4	4	5	7	8	9	9	9	9	9	10	10	10
La Union	....	....	....	....	....	4	4	5	7	8	9	9	9	9	9	10	10	10
La Libertad	....	....	....	....	....	....	4	4	7	8	8	8	8	8	8	9	9	10
Acajutla	....	....	....	....	....	....	....	4	6	6	8	8	8	8	8	9	9	10
San Jose de Guatemala	....	....	....	....	....	....	....	....	3	5	6	7	7	7	7	8	8	10
Champerico	....	....	....	....	....	....	....	....	....	3	5	6	6	6	6	8	8	10
Ocos	....	....	....	....	....	....	....	....	....	....	3	5	5	5	5	7	7	10
San Benito	....	....	....	....	....	....	....	....	....	....	....	5	5	5	5	7	7	10
Tonala	....	....	....	....	....	....	....	....	....	....	....	....	5	5	5	7	7	10
Salina Cruz	....	....	....	....	....	....	....	....	....	....	....	....	....	5	5	7	7	10
Puerto Angel	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	7	7	10
Acapulco	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	7	8
Manzanillo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	7
San Blas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6

From Panama to San Francisco, $18.

In addition to the preceding table, which shows the rates of freight for long and short hauls from Panama to San Francisco, I submit the Pacific Mail Steamship Company's tariff for freight from San Francisco to Panama, which gives the long and short haul rates on some eighty-seven different staples and articles, to all points south from San Fran-

cisco, in Mexico, in Central America, and Panama. From this table, it will be seen that the rates southward are considerably higher on the short hauls. This table also shows what the cargoes from San Francisco southward are composed of.

Freight rates, San Francisco to ports named.

[2,000 pounds = 1 ton weight; 40 cubic feet = 1 ton measurement.]

Articles.	Central America.		Mexico.			United States of Colombia.		South America.		
	Amapaia, Corinto, San Juan del Sur, Puntas Arenas.	Ocos, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union.	Port Angel, Salina Cruz, Tonala, San Benito.	San Blas, Manzanillo, Acapulco.	Mazatlan.	Panama.	Buenaventura, Tumaco.	Ecuador: Esmeraldas, Babai, Manta, Guayaquil.	Peru: Payta, Pimentel, Eten, Pacasmayo, Salaverry, Callao, Pisco, Chala, Mollendo, Ilo.	Chile: Iquique, Tocopillo, Antofogasta, Taltal, Caldera, Carrizal Bajo, Coquimbo, Valparaiso.
Agricultural implements, meas..	$18.00	$18.00	$18.00	$12.00	$8.00	$18.00	$24.00	$24.00	$28.00	$28.00
Ales and porters.....meas..	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Beer (bottled, casks, or cases).....meas..	10.00	10.00	10.00	8.00	8.00	10.00	20.00	20.00	24.00	24.09
Boilers, weight or meas., ship's option:										
Under 2,000 pounds.....	18.00	18.00	18.00	11.00	8.00	18.00	28.00	28.00	32.00	32.00
2,000 to 6,000 pounds....	25.00	25.00	25.00	17.00	12.00	25.00	32.00	32.00	40.00	40.00
6,000 to 12,000 pounds...	32.00	32.00	32.00	24.00	16.00	32.00	40.00	40.00	48.00	48.00
Bees in hive.....each..	6.00	6.00	6.00	6.00	4.00	6.00	12.00	12.00	15.00	15.00
Bags (coffee and sugar, bales).....meas..	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Brooms (cases).....do....	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Broom corn (compressed), meas.....	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Bran.....weight..	27.00	27.00	27.00	18.00	12.00	27.00	40.00	40.00	50.00	50.00
Barley (large lots same as wheat).....weight..	18.00	18.00	14.00	12.00	8.00	18.00	24.00	24.00	28.00	28.00
Beans and peas (dried, in sacks).....weight..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Cinnamon.....do....	35.00	35.00	35.00	25.00	15.00	35.00	48.00	48.00	60.00	60.00
Corn.....do....	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Cattle.....each..	70.00	70.00	70.00	55.00	45.00	70.00	Valuable by special contract.			
Cement (barrels)..weight..	12.00	12.00	12.00	12.00	8.00	12.00	20.00	20.00	24.00	24.00
Crockery (common)..meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Canned goods.....do....	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Coal.....weight..	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Castings (see Stoves).do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Doors.....meas..	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Dry goods.....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Flour.....weight..	14.00	10.00	13.00	12.00	8.00	14.00	20.00	20.00	24.00	24.00
Fruit (green, owner's risk), meas.....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Fruit and vegetables (canned).....meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Furniture (common)..do....	16.00	16.00	16.00	12.00	8.00	16.00	28.00	28.00	32.00	32.00
Fungus.....weight..	32.00	32.00	32.00	30.00	16.00	32.00	48.00	48.00	60.00	60.00
Firecrackers (on deck, owner's risk).....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Fire brick.....weight..	11.00	11.00	11.00	10.00	8.00	11.00	20.00	20.00	24.00	24.00
Garlic.....meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Groceries (not otherwise specified).....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Horses.....each..	110.00	110.00	90.00	85.00	65.00	110.00	Valuable by special contract.			
Herring.....meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Hops.....do....	15.00	15.00	15.00	10.00	8.00	15.00	20.00	20.00	24.00	24.00
Hardware.....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Honey (in tins or barrels), meas.....	18.00	18.00	18.00	12.00	8.00	18.00	32.00	32.00	40.00	40.00

Freight rates, San Francisco to ports named—Continued.

[2,000 pounds = 1 ton weight; 40 cubic feet = 1 ton measurement.]

Articles.	Central America.		Mexico.			United States of Colombia.		South America.		
	Amapaia, Corinto, San Juan del Sur, Puntas Arenas.	Ocos, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union.	Port Angel, Salina Cruz, Tonala, San Benito.	San Blas, Manzanillo, Acapulco.	Mazatlan.	Panama.	Buenaventura, Tumaco.	Ecuador: Esmeraldas, Bahai, Manta, Guayaquil.	Peru: Payta, Pimentel, Eten, Pacasmayo, Salaverry, Callao, Pisco, Chala, Mollendo, Ilo.	Chile: Iquique, Tocopillo, Antofogasta, Taltal, Caldera, Carrizal Bajo, Coquimbo, Valparaiso.
Hay (compressed, 18 pounds per cubic foot) ...weight..	25.00	25.00	25.00	20.00	15.00	25.00	40.00	40.00	50.00	50.00
Iron (bar, band, hoop, sheet, corrugated) .....weight..	13.00	13.00	13.00	11.00	8.00	13.00	28.00	28.00	32.00	32.00
Jewelry (1 per cent on value in addition) .....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Leather .....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Laths.....per M..	4.00	4.00	4.00	2.50	2.00	4.00	7.00	7.00	10.00	10.00
Liquors (not otherwise specified) .....meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Lumber.....per M..	24.00	24.00	20.00	16.00	16.00	20.00	32.00	32.00	40.00	40.00
Lard.....weight..	18.00	18.08	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Merchandise (general), weight or meas., ship's option).....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Malt.....weight..	15.00	15.00	15.00	12.00	10.00	15.00	25.00	25.00	30.00	30.00
Matches (in tins, on deck, owner's risk).....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Match wood .....do....	12.00	12.00	12.00	12.00	8.00	12.00	20.00	20.00	24.00	24.00
Machinery, weight or meas., ship's option.....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Machinery (large), weight or meas., ship's option, same as boilers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Musical instruments (released) .....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Moldings .....meas..	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Nails .....weight..	13.00	13.00	13.00	11.00	8.00	13.00	28.00	28.00	32.00	32.00
Nuts.....meas..	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Oats .....weight..	22.00	22.00	22.00	18.00	12.00	22.00	40.00	40.00	50.00	50.00
Oil, coal (when taken), meas.	22.00	22.00	22.00	12.00	10.00	22.00	35.00	35.00	45.00	45.00
Oils (in tins or barrels) .do....	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Onions (bags or boxes) .do....	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Opium.....value per cent..	1	1	1	1	1	1	2	2	2	2
Paints (in tins) .....meas..	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Plated ware (1 per cent on value in addition) ..meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Potatoes (bags or boxes), weight.....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Quicksilver.....weight..	15.00	15.00	15.00	12.00	8.00	15.00	28.90	28.00	30.00	30.00
Rice (in mats) .....do....	15.00	15.00	15.00	12.00	8.00	15.00	24.00	24.00	28.00	28.00
Sheep (for mutton) ...each..	5.00	5.00	5.00	3.00	2.50	5.00	Valuable by special contract.			
Safes (weight):										
Under 2,000 pounds.....	18.00	18.00	18.00	11.00	8.00	18.00	28.00	28.00	32.00	32.00
2,000 to 6,000 pounds	25.00	25.00	25.00	17.00	12.00	25.00	32.00	32.00	40.00	40.00
6,000 to 12,000 pounds...	32.00	32.00	32.00	24.00	16.00	32.00	40.00	40.00	48.00	48.00
Sago.....weight..	25.00	25.00	25.00	18.00	12.00	25.00	40.00	40.00	50.00	50.00
Salt .....do....	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Salmon (barrel or case), meas.....	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00
Sash and blinds (owner's risk).....meas..	15.00	15.00	15.00	10.00	8.00	15.00	24.00	24.00	28.00	28.00
Shingles .....per M..	3.00	3.00	3.00	2.50	2.00	3.00	6.50	6.50	9.00	9.00
Silk .....meas..	27.00	27.00	27.00	18.00	12.00	27.00	40.00	40.00	48.00	48.00
Shooks .....do....	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Shrimps (in bags) ..weight..	18.00	18.00	18.00	12.00	8.00	18.00	24.00	24.00	28.00	28.00
Spices (see Cinnamon), meas.	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Stoves.....do....	16.00	16.00	16.00	12.00	8.00	16.00	24.00	24.00	28.00	28.00
Tobacco.....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Tea .....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Tallow.....weight..	15.00	15.00	15.00	12.00	8.00	15.00	24.00	24.00	28.00	28.00

Freight rates, San Francisco to ports named—Continued.

[2,000 pounds = 1 ton weight; 40 cubic feet = 1 ton measurement.]

Articles.	Central America.		Mexico.			United States of Colombia.		South America.		
	Amapaia, Corinto, Sur, Puntas Arenas.	Ocos, Camperico, Guatemala, Acajutla, La Union.	Port Angel, Salina Cruz, Tonala, San Benito.	San Blas, Manzanillo, Acapulco.	Mazatlan.	Panama.	Buenaventura, Tumaco.	Ecuador: Esmeraldas, Bahai, Manta, Guayaquil.	Peru: Payta, Pimentel, Eten, Pacasmayo, Salaverry, Callao, Pisco, Chala, Mollendo, Ilo.	Chile: Iquique, Tocopillo, Antofogasta, Taltal, Caldera, Carrizal Bajo, Coquimbo, Valparaiso.
Treasure (sealed packages), value per cent	1	1	1	1	1	1	2	2	2	2
Vegetables (n. o. s., owner's risk)....meas..	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Wire, barbed.....do....	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Woodenware.....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Willowware.....do....	18.00	18.00	18.00	12.00	8.00	18.00	28.00	28.00	32.00	32.00
Wagons (knocked down; setup, specialrate), meas..	18.00	18.00	18.00	12.00	8.00	18.00	24.00	24.00	28.00	28.00
Wheat.....weight..	12.00	12.00	12.00	10.00	8.00	12.00	20.00	20.00	24.00	24.00
Wines and bitters (California).....meas..	10.00	10.00	10.00	8.00	8.00	10.00	20.00	20.00	24.00	24.00
Wines (foreign).....do....	15.00	15.00	15.00	12.00	8.00	15.00	28.00	28.00	32.00	32.00

NOTE.—The rate above given for flour to ports in Guatemala and Salvador is fixed at a reduction of 25 per cent, as provided in the mail contracts with those States.

No bill of lading signed for less than $3 to Mazatlan, San Blas, Manzanillo, and Acapulco, $4 to ports south of Acapulco to Panama, and $8.50 to Buenaventura, Tumaco, and South American ports. This tariff does not apply to articles of unusual bulk or weight, which are taken only by special agreement. The freight on live stock must be prepaid and taken by written contract only. The freight must be prepaid on all perishable articles; and must be prepaid on all freight to all ports, except Mazatlan, Panama, Callao, and Valparaiso, and to the two latter when less than $20. The company reserves the right to alter this tariff at any time. Where "weight" and "measurement" are mentioned they mean 2,000 pounds or 40 cubic feet. All freight not named herein, or clearly analogous to articles named, will be charged general merchandise rate.

The tonnage carried by the Pacific Mail Steamship Company during the year 1893 from San Francisco to Panama, amounted to 46,563 tons, the destination of which was as follows: New York, 9,686; Europe, 31,441; South Pacific ports, 2,485; Panama and vicinity, 2,953.

The tonnage from Panama to San Francisco by the Pacific Mail Steamship Company was as follows: Panama and South Pacific ports, 1,473; from New York, via Panama, 12,984; from Europe, via Panama, 35,100, or a total of 49,557 tons, and a gross total, both ways, of 96,120 tons, without counting coffee, to which I will allude immediately. All of this in spite of the strong competition of the North American Navigation Company.

From Central American ports, the steamers of the Pacific Mail Steamship Company brought to Panama 564,049 sacks of coffee, averaging 152 pounds each, gross. This coffee was destined as follows: For New York, 73,986 sacks; for Europe, 489,659 sacks; for the Isthmus and South Pacific ports, 404 sacks. I am unable to find out how many sacks of coffee were taken to San Francisco by the steamers of this line

on their homeward trip; these figures can be obtained from the custom-house at that place, but I am informed by persons in a position to know that it should be at least 250,000 sacks. This coffee trade from Central America is growing larger and larger every year, and it is safe to say that not less than 500,000 sacks were taken by French, German, Italian, and English tramp steamers to their respective countries, but especially to Hamburg, Germany.

The treasure carried by this line from Panama to San Francisco in 1893 was as follows: From Panama and South Pacific ports, $944,476; from New York, via Panama, $79,930; from Europe, via Panama, $98,279; total, $1,122,685.

The passengers to Panama from San Francisco, Mexico, and Central America during 1893 numbered 475 cabin and 757 steerage. From Panama to San Francisco, Central America, and Mexican ports the line carried 1,526 cabin and 795 steerage passengers, a grand total of 3,553 passengers, out of which there were only 43 "deadheads."

PANAMA RAILROAD.[1]

This very important connecting link between the Pacific and the Atlantic oceans has become a part of the assets of the Panama Canal Company, but it is operated under American charter (New York), a board of directors being kept in New York City for that purpose.

---

[1] The New Orleans Picayune of June 20, 1895, says:

"The enterprise inaugurated by the Wholesale Grocers' Association of this city, in putting in operation a ship between this city and the Isthmus of Panama, connecting there with the Panama Railroad and with a line of vessels from California points, now promises to develop into a permanent steamship line to the Isthmus. The first vessel of the new line is to sail shortly, and it is now understood that she will be followed by other vessels at regular intervals. A moderate-sized steamship is to be used at first; but it is expected that, as the business develops, a larger vessel will be placed in commission.

On the 9th of July, however, the Picayune announced that the enterprise would be abandoned. "The experimental trip of the steamship *Oteri*," said the Picayune, "has demonstrated fully that it is entirely practicable to compete with the railroads in the Pacific coast trade by water via the Isthmus of Panama, and in that sense the experiment has been a success. It has also apparently convinced the railroads that New Orleans is entitled to consideration on a parity with New York, as the rate from the Pacific coast has been fixed at the same figure as that asked to New York, which is the concession originally demanded by the merchants. The business men have, therefore, carried their point, and for that reason are willing to abandon the steamship line." But four days later—July 11—the Picayune stated that the experiment had served to turn the attention of the Panama Railroad Company to the excellent field offered by New Orleans for the inauguration of a line which would connect the railroad company's property on the Isthmus and its lines to Pacific coast points with the Mississippi valley. "It is now announced," adds the Picayune, "that the Panama Railroad Company proposes to inaugurate a line of steamships between this city and Colon, the Atlantic terminal of the railroad, with a view not only to compete with the transcontinental railroads in the Pacific coast trade, but to also build up a business with the west coast of South America in passengers and freight."

The termini of the road are Colon, on the Atlantic side, and Panama, on the Pacific. The length of the line is 47 miles, and there are thirty-four stations, to wit:

Stations.	Distances from Colon.	Stations.	Distances from Colon.	Stations.	Distances from Colon.
	Miles.		*Miles.*		*Miles.*
Ch. Columbus	0.30	Barbacoas	22.98	Empire	34.88
Monkey Hill	1.86	San Pablo	23.48	Culebra	36.71
Mindi	4.56	Bailamonos	24.45	Rio Grande Superior	37.30
Gatun	6.60	Mamei	25.86	Cucaracha	37.97
Tiger Hill	8.17	Juan Grande	27.46	Paraiso	39.09
Lion Hill	10.57	Gorgona	28.60	Pedro Miguel	40.34
Ahorca Lagarto	12.70	Bas Matachin	29.11	Pedro Miguel Tank	40.78
Bujio	15.45	Matachin	29.97	Miraflores	41.69
Buena Vista	16.77	Bas Obispo	31.05	Rio Grande	42.98
Frijoles	18.77	Haut Obispo	31.94	Corozal	44.17
Tabernilla	21.55	Las Cascadas	33.11	Panama	47.00

The most important intermediate points are Gatun, Bujio, Frijoles, San Pablo, Matachin, and Culebra.

Gatun.—It is at this place that the railroad first strikes the Chagres. The station is on the right and the town on the left bank of the river. It is a very old place and a great point for the banana trade. The Panama Canal crosses the Chagres at this point.

Bujio.—This is the great isthmian center of the banana supply. It is at this point that the first lock of the Panama Canal on the Atlantic side is to be built; boats have ascended the canal within 4 miles of the place. Of course, the canal works have greatly deteriorated since the canal company went into bankruptcy.

Frijoles.—This is the place where the water supply for the town of Colon is secured during the dry season. Excellent drinking water is to be found here, and the Panama Railroad Company has erected small waterworks at this point. This water is delivered by the railroad company to the people in Colon free of cost. Water-tank cars are filled with it and taken to Colon.

San Pablo.—Very near to this place, the railroad crosses the Chagres over an excellent iron bridge. It is the strategical point of the road.

Matachin.—This is the great depot of canal material, and the half-way station. The passenger trains from Colon and Panama meet here. Just now there is only one passenger train each way per day; specials are run when occasion requires. At this point the grade of the road is such as to necessitate two engines up to Culebra for the working of the freight trains. During the coffee season, from December 1 to June 1, the freight traffic is very large.

Culebra.—This is at the summit of the isthmian Andes, perhaps the lowest point in the range of mountains that runs from North America all the way through South America. It is only 333 feet above the level of the sea, and is the dividing plane for the waters to the Atlantic and to the Pacific. The Panama Canal Company has made a cut here of nearly 100 feet in depth.

The condition of the line is excellent, and its equipment sufficient for all purposes. It is a single-track line, broad gauge, with an average grade of 1.6 per cent. The rate for first-class passengers from Colon to Panama is $4 in American gold, and the same from Panama to Colon. Until 1887, the rate was $25, gold. The rates to intermediate points are proportionate. There are seven different classes of freight, the rates of which are as follows: First class, 40 cents per cubic foot; second class, 1.2 cents per pound; third class, 0.8 cent; fourth class, 0.6 cent; fifth class, 0.4 cent; sixth class, 0.2 cent; seventh class, nominal. The payment of all dues must be in United States gold coin.

The freight transported by the Panama Railroad during the year 1893 amounted to 200,082 tons. It has, in better years, carried as much as 500,000 tons.

The number of passengers carried by the line during the same period was 42,018; it has carried as many as 1,200,000 in a year.

The line, for the first time in its history, failed to make money in 1893; it lost $18,000, as stated in the annual report of the Panama Railroad Company for that year. This loss was due, chiefly, to difficulties with the Pacific Mail Steamship Company.

The railroad was built by Colonel Totten, an American, with American capital, and is a credit to American pluck and enterprise, considering that it was commenced in 1850, when the Isthmus was a dense wilderness and the climate most deadly, owing to infected swamps and the intense heat.

There is no comparison, so I am told by people living here then, with the isthmus of to-day and the isthmus of some forty years ago. It took five years to build this railroad, and most of the manual labor was performed by Chinamen. Anyone going over the line can not fail to admire the pluck and energy of the men who made the original survey of this route. It is one of the bravest feats of engineering ever accomplished, and will remain an imperishable monument to those who made it.

It was on the 15th day of April, 1850, that the concession was granted by the Republic of Colombia to the Panama Railroad Company, and it was or is, perhaps, the richest concession ever granted to a corporation by any government, inasmuch as Article II of that concession gave the Panama Railroad the right of way all over the State of Panama from sea to sea, a distance of some 400 miles, and for all kinds of roads, whether by rail, by water, or wagon, besides a large land grant, and many other privileges. However, the Panama Railroad Company virtually ceded the right of way to the Panama Canal Company when the latter purchased the controlling shares of the railroad, and both the Government and the Panama Railroad Company have been great losers thereby, since the former never received its share in money as a consideration for the right of way ceded to the canal company, while the

latter is to-day an asset of the bankrupt Panama Canal Company. The concession is for ninety-nine years, and during the whole of that time the Panama Railroad Company is to pay annually to the Republic of Colombia $250,000 in gold, besides $1,000,000 paid in cash when the concession was signed. However, all this money was hypothecated to a firm of New York capitalists as security for a loan needed by the Government of Colombia after the revolution of 1879.

This synopsis of the history of the Panama Railroad is given in answer to the demand "for accurate historical notes upon important highways." I have made it as brief as I could. A whole book of interesting historical items in connection with the Panama Railroad, once wholly controlled by American capital, but to-day controlled by French capital, could be written.

I may add, in the line of historical notes, that Panama was not intended to be the Pacific terminus of the Panama Railroad. The road was to be built to Naos Island, some three miles farther away. It is at, or near, this island that all the steamers anchor, and the Pacific Mail Steamship Company has quite an establishment on it. By the terms of the concession the railroad forfeits annually $30,000 to the Department of Panama until the railroad reaches Naos, or until vessels are enabled to discharge their cargoes on the main shore. Steps are now being taken to bring this about, the canal company intending to dredge the bay at the Pacific mouth of the canal (La Boca) so as to enable vessels of any size to enter, thus doing away with the expensive system of lighterage now in vogue here. The new city of Panama was established in 1671, very soon after old Panama, which was situated on the east side of the bay, had been destroyed by Morgan, the buccaneer. The entire place was laid in ruins, and he only spared the tower of La Merced, which is still standing. This tower stands there, alone and solitary, the only remaining witness to the horrible deeds committed. It is the tombstone of old Panama, and the grave over which it casts its shadow contains thousands of innocent victims. Old Panama was larger than the Panama of this day, and its wealth was something surprising. Morgan left one of his cannons on the field of his most terrible exploit, as a memento of his extraordinary daring.

VICTOR VIFQUAIN,
PANAMA, *June 1, 1894.* *Consul-General.*

THE PANAMA CANAL.

The construction of a canal across the Isthmus of Panama, to connect the waters of the Atlantic and Pacific, and thus provide a great international highway of commerce, was suggested during the earlier period of the Spanish occupation, nearly three and one-half centuries ago. No practical steps, however, were taken until 1876, when surveys were made by French engineers. In 1878, the Colombian Government granted a concession for building the canal, and in the following year

M. de Lesseps, the noted French engineer, who built the Suez Canal, took the matter up. A company was organized, with a nominal capital of 600,000,000 francs ($115,800,000), to be obtained by popular subscriptions in France, and the work of construction was begun in October, 1881. The canal was to follow much the same route as that of the railway from Colon to Panama. It was to be 54 miles in length; the bottom to lie 28 feet below the mean level of the oceans; the width to be 72 feet at bottom and 160 feet at top, except in the section through the Calebra ridge, where the depth was to be 9 meters (29.53 feet); the bottom width 24 meters (78.91 feet), and the top width 28 meters (91.86 feet). The special difficulties to be encountered were the piercing of the Cordillera and the overflow of the Chagres River and its tributaries. In January, 1884, a little more than two years after beginning the work, but one-thirtieth of the excavation had been completed, although during 1883, a force of 11,000 men was employed. The cost of the work proved to be enormous, and much of the money, it was claimed, was wasted by extravagant management. According to the Handbook of Colombia, published by the Bureau of the American Republics, the canal company had raised, up to June 30, 1886, the sum of 772,545,412 francs ($137,521,265), or nearly 172½ millions more than the original estimate, and it was then stated that nearly as much more would be required to complete the work. Finally, in March, 1889, work was stopped for want of funds, and provisional administrators were appointed by the French courts. Various schemes of reorganization were proposed, but little of actual importance was effected until 1894, when steps were taken for the formation of a new company, and work was provisionally resumed.

COMMERCE AND TRANSPORTATION.[1]

The maritime ports of entry in Colombia are Rio Hacha, Santa Marta, Sabanilla, and Cartagena, on the Atlantic; Buenaventura and Tumaco, on the Pacific. Colon and Panama, on the Isthmus, are free ports. Over thirty regular steamers call at Cartagena, Sabanilla, and other ports, besides Colon and Panama.

The chief method of carrying merchandise to and from the coast is by means of the great rivers, the Magdalena being the most important. With the exception of river traffic and nine short lines of railroads, with a total length of 218 miles, the interior commerce is carried on by means of mules. As the country is mountainous, nearly all freight must be transported by mules as soon as it leaves the rivers. Several concessions have been granted for the construction of new railroads. In July, 1894, Consul Smyth, of Cartagena, reported to the Department (see Consular Reports, 170, November, 1894, p. 416) that a railroad 60 miles

---

[1]Compiled from Handbook of Colombia, published by the Bureau of the American Republics in January, 1892, the Statesman's Year Book for 1895, and United States Consular Reports.

long, from Cartagena to Calamar, on the Magdalena River, had been completed and opened for traffic.

The postal service is well organized, and nearly 7,000 miles of telegraph is in operation, with connections with Ecuador and Venezuela. The foreign cable service is satisfactory.

VENEZUELA.

PORT OF MARACAIBO.

The Red D Line, trading between New York, Curaçao, and the Venezuelan coast, has placed one steamer, the *Maracaibo*, of 1,260 tons, on the through route between New York and Maracaibo, making one round trip monthly. This is a freight and mail boat, carrying no passengers.

Another steamer of the same line, the *Merida*, plies between Maracaibo and Curaçao, but is only an adjunct of the main line, the larger steamers of which do not touch in the consular district of Maracaibo.

There are no coastwise lines.

There are two railways in operation in this district and one in course of construction. Neither, however, can be classed as a through line of traffic, as they extend but a short distance from the lake coast into the interior.

The lines in operation are:

(1) The La Ceiba Railway, owned by a company, extending from La Ceiba, a port on the east coast of the lake, to Sabana de Mendoza, a distance of about 30 miles. This line is in process of extension to the town of Valera.

(2) The San Carlos and Merida Railway, owned by a French company, extending from San Carlos, a town on the River Escalante, at the southern extremity of Lake Maracaibo, to La Vigia, at the foot of the Cordillera, a distance of about 45 miles. The original intention was to build the road to the city of Merida, but this has been practically abandoned. The road now being constructed starts from the town of Encontrados, on the River Catatumbo, and is intended to tap the coffee regions of the western Cordillera, eventually reaching the city of San Cristobal.

As in the case of the railways, the river lines are only local, three rivers being open to navigation, the Escalante, Catatumbo, and Zulia.

The San Carlos and Merida Railway Company has one steamer plying between its river terminus and Maracaibo, and this is only an accessory of the railroad.

One large steamer makes weekly trips from this city to Encontrados, on the Catatumbo River, and there the passengers and freight are transferred to smaller steamers which ascend the River Zulia to Puerto

Villamizar, in Colombia, from which point to the city of Cucuta there is a railway. This last is the nearest approach to a through line existing in this district, although in reality it is merely local.

Of highways there are none, and in no part of the district are there roads for wheeled vehicles.

E. H. PLUMACHER,
Consul.

MARACAIBO, *May 30, 1894.*

PORT OF LA GUAYRA.[1]

The city of La Guayra, on the Caribbean Sea, 24 miles by railroad from the capital, Caracas, is the chief seaport of Venezuela. It is connected by cable with the United States, via Curaçao, Santo Domingo, and Cuba, and has a breakwater which has transformed the rough roadstead into a safe and commodious port. Steamers of the Red D and other lines give regular communication between La Guayra and points along the coast, West Indian ports, New York, Southampton, Liverpool, Hamburg, Amsterdam, Havre, Ste. Nazaire, Genoa,[2] Spanish ports, etc.

RAILWAYS, TELEGRAPHS, ETC., IN VENEZUELA.

According to the Statesman's Year Book for 1895 there were 385 miles of railroad in operation in Venezuela in 1894 and 1,000 miles under consideration. Venezuela is a member of the Postal Union, and in 1893 there were 3,833 miles of telegraph lines. Various centers of trade are also connected by telephone.

Consul Plumacher, of Maracaibo, has sent the Department the following information as to new lines of railroad in Venezuela:

October 3, 1894 (printed in Consular Reports, November, 1894, p. 418):

"Contract entered into by the Government of Venezuela for the construction of a railroad from Puerto Cabello to Carenero. Should this project be carried out the coast towns will receive incalculable benefit, and the railway will be one of the most important in Venezuela. The contract was made by the minister of public works and the Soller Navigation Company, of Barcelona, Spain, represented by Juan Baptista Soles Ferre. The Soller Navigation Company obligates itself to build, within four years from April 2, 1894, a railroad which, starting from Puerto Cabello and passing through La Guayra and the coast towns, shall terminate at Carenero."

November 15, 1894 (printed in Consular Reports, January, 1895, p. 128):

"Contract for the construction of a railway between the city of Coro and Sabaneta, touching at various intermediate points. The line will

---

[1] Compiled from the Handbook of Venezuela, published by the Bureau of the American Republics in February, 1892, and United States Consular Reports.

[2] See Consular Reports No. 163, April, 1894, p. 706.

be of considerable local importance, giving easy means of transportation from the interior to Coro. The direct railway communication which now exists between the seaport of Tucacas and the city of Barquisimeto, metropolis and capital of the rich agricultural state of Lara (formerly Barquisimeto), has injured Coro as a shipping and receiving port, and it is only by means of railways from the latter city to the interior that it can regain control of this traffic."

March 12, 1895 (printed in Consular Reports, May, 1895, p. 155):

"*Ceiba railway extension.*—The original road extended from the port of La Ceiba, on the east coast of Lake Maracaibo, 30 miles, to Sabana de Mendoza, at the foot of the mountains of western Venezuela. It was decided to build an extension to the coffee region of the interior, and the project was successfully carried through. Leaving Sabana de Mendoza, the road runs to the eastward for a distance of 30 kilometers (18.64 miles) to a point called El Iobal. There it bifurcates—one branch to extend to the city of Valera, distant about 24 kilometers (14.91 miles) from El Iobal, and the other to the town of Pampanito, 22 kilometers (13.67 miles) from the point of bifurcation. Valera is the metropolis and business center of that entire section, although it is not the political capital, and the products of a vast territory pass through the city on their way to the lake coast for shipment to Maracaibo. In the same manner, all merchandise and foreign imports entered here and destined for that section of the interior are sent to Valera as the final distributing point. The branch line to Pampanito will serve that part of the district lying beyond the influence of Valera, so that, with the completion of these enterprises, all parts of a very large section of productive territory, where both agriculture and commerce are being rapidly developed, will be within easy reach of steam transport to the coast."

April 3, 1895 (printed in Consular Reports, May, 1895, p. 158):

"*Encontrados to La Fria.*—Upon the lapsing of a former concession for the construction of a direct railway, wholly on Venezuelan territory, to tap the great coffee-producing region of the western Cordillera, the Messrs. Roncajolo, of Maracaibo, who built and carried to a successful conclusion the Ceiba road and its extensions, contracted with the Government for the construction of a line which is now being pushed as rapidly as possible.

"Starting from Encontrados, on the right bank of the Catatumbo, accessible to the largest craft navigating Lake Maracaibo, the line follows the general course of that river and its tributary, the Zulia, to a point styled La Fria, 100 kilometers (62.14 miles) from its starting point. An extension of 40 kilometers (24.85 miles) farther to the south would bring the road to the city of San Cristobal, in the very heart of the great agricultural section, and now a commercial center of constantly increasing importance, and this extension will, no doubt, be built; but for the present the terminus of the line may be considered to be at La

Fria. Of these 100 kilometers (62.14 miles), 50 kilometers (31.7 miles) are completed, and trains are running. Within three or four months, the line will reach a point as near San Cristobal as is Cucuta, where coffee from the former city and district can arrive by means of animal transport.

"The completion of the line to this point is anxiously awaited, as then there will be no longer any necessity for crossing the frontier into Colombia, and expenses will be vastly reduced. This applies equally to merchandise from Maracaibo to the interior, and the completion of a few more kilometers of the road will cause an immediate revolution in the transport system between the Cordillera and this port."

April 4, 1895 (printed in Consular Reports, May, 1895, p. 160):

"Two contracts, the first for a line from Maracaibo to Perija, and the second for a road from a point on the east coast of the lake opposite Maracaibo to the city of Carora, with ultimate extension to Barquisimeto, the most important interior city of Venezuela. The Perija road will communicate with and open up an extensive region of remarkable fertility and rich in mineral products, and the Carora line will give Maracaibo easy communication with the rest of the Republic, from which topographical conditions have kept it, until now, in a state of practical isolation. The city of Barquisimeto has already a railroad to the coast, its terminus being at Tucacas, west of Puerto Cabello, and upon the completion of the line from Lake Maracaibo the conditions of traffic will be changed greatly for the better."

BRITISH GUIANA.

OCEAN LINES.

This colony can be reached from the United States by two direct lines of steamers, the Armstrong Line and the Royal Dutch West India Mail Service; and indirectly by the Quebec Steamship Company, George Christall & Co.'s steamers, and the Brazilian Steamship Company, which ply between New York, Barbados, and Trinidad, where connections can be made direct to Demerara with either of the following steamship companies: Royal Mail Steam Packet Company, Pickford & Black's Canadian Line, the Compagnie Générale Transatlantique, and the Clyde Line.

The Quebec Company's steamers, however, are those mostly patronized by travelers to this colony. This line is also generally used by the post-office authorities at New York for the conveyance of mails to this place.

First-class fare to Barbados is $60, and from that place to Demerara, by the Royal Mail Packet Company, the fare is $19.20.

The Armstrong Line, controlled by Messrs. L. W. and P. Armstrong, of New York City, employs one steamer of 917 tons burden, which

leaves New York once a month direct for Demerara, making the trip (2,200 miles) in about eleven days. This vessel carries mails and freight, and, although a cargo boat, has accommodations for several passengers. The rate for passengers is $60. The charge for freight is 40 cents per 100 pounds, or by measurement 12 cents per cubic foot, and an additional charge of 5 per cent primage.

The Royal Dutch West India Mail Service is a corporate body under contract with the Netherlands Government for the conveyance of the mails, and employs six vessels, viz:

Steamers.	Tons.	Horse-power.
Prins Willem I	1,087	1,250
Prins Willem II	1,242	1,250
Prins Willem III	1,268	1,250
Prins Frederik Hendrik	1,079	1,200
Prins Maurits	928	750
Oranje Nassau	922	750

These vessels sail from New York for Amsterdam on every third Saturday, calling at Port au Prince, Aux Cayes, Jacmel, Curaçao, Puerto Cabello, La Guayra, Carupano, and Trinidad, arriving at this port in from twenty-three to twenty-six days. After a stay here of about thirty-six hours they proceed to Amsterdam, making one other stop, at Surinam, Dutch Guiana. There are accommodations for from 25 to 30 first-class passengers on each vessel, the fare being $90 from New York to Demerara. The ordinary freight rate between Demerara and New York is $2.68 per ton for general merchandise, and for sugar 12 cents per 100 pounds.

RAILWAYS.

The only line of railroad in this colony is the Demerara Railway, a single-track road, controlled by a corporate body, extending along the eastern coast of the county of Demerara from the city of Georgetown to Mahaica, a distance of 20 miles. There is a daily service of five trains, but only two on Sundays. The rate for first-class passengers is about 5 cents per mile, and each passenger is allowed 84 pounds of baggage free of charge. Freight is charged for at the rate of $2.16 per ton on through traffic. Freight is divided into three classes, viz: Up to 28 pounds, 12 cents; 28 to 56 pounds, 16 cents; 56 pounds to a ton, 24 cents. The distance between intermediate points is so small that there is very little difference made in the charges for through traffic and short hauls.

NAVIGABLE RIVERS.

The rivers are navigated by fifteen steamers, the property of the Sproston Dock and Foundry Company, worked under contract with the Colonial Government. These steamers are small, with a draft of 3 to 5 feet. Some are fitted up for passengers, while others have only deck

accommodations. They leave daily for various parts of the colony, carrying passengers, mails, and freight. The fare for first-class passage averages about 5 cents per mile. Freight is charged for by the parcel or package; for every 100 pounds, or part of 100 pounds, or of a cubic content of 3 feet or part of 3 feet, 8 cents. Passengers are allowed to carry 50 pounds of baggage free of charge, any excess being charged at the same rate as freight.

HIGHWAYS.

There is but one important highway. This is used for the transmission of mails and passengers and is macadamized, being about 16 feet in width. It begins at the terminus of the Demerara Railway and extends along the coast about 50 miles, to the town of Blairmont, Berbice County. This road is under the supervision of the Colonial Government, and is used principally as a mail route, although the mail coaches have accommodations for five persons. The coaches leave daily, upon the arrival of the first morning train from Georgetown. The fare from Mahaica to Blairmont is $3. No freight is carried on these coaches, but 30 pounds of baggage is allowed each passenger without additional charge.

JAMES SPAIGHT,
Vice Consul.

DEMERARA, *June 2, 1894.*

BRAZIL.[1]

OCEAN LINES.

Hon. Robert Adams, jr., United States minister to Brazil, made a report to the Department of State upon the ocean lines of Brazil, dated October 9, 1889 (printed in Consular Reports No. 112, p. 74), from which the following extracts are taken:

BRITISH FLAG (EIGHT LINES).

(1) *London and Antwerp direct line to Brazil.*—This service is performed by steamers chartered for the purpose, having none of their own. Arrivals here are four and five per month. They generally sail from this port or Santos in ballast homeward, seeking employment. Cargo capacity, 2,000 to 3,000 tons. No passengers. No State aid. Freight rate, 20 to 30 shillings per ton.

(2) *Direct line to Brazil from London, Hamburg, and Antwerp.*—This service is about equal in all respects to that of the above-mentioned company. The steamers of both lines sometimes go as far as Rio Grande do Sul and Porto Alegre. Freight rate, 20 to 30 shillings per ton. No State aid.

(3) *Royal Mail Steam Packet Company.*—From Southampton to River Plate; fortnightly sailings from each end, touching both ways at Brazilian ports; sailing dates strictly observed. This company has a large and magnificent fleet of fast passenger and cargo steamers, and employ the requisite number in this trade to make fortnightly sailings, also giving extra voyages when required. Passenger accommodation, 200 to 250 first class, 150 second class, and 500 to 700 third class; cargo space,

---

[1] No replies to Department circular were received from consular officers in Brazil.

about 3,500 tons each. The steamers now on this route are nearly all new, and make very rapid voyages. Freight rate, 25 to 40 shillings per ton. The company operates in other directions also. Receives State aid.

(4) *Liverpool, Brazil, and River Plate Steam Navigation Company, Limited.*—From Liverpool, London, and Antwerp to Brazilian ports, as far as Santos, and direct to River Plate. Regular arrivals in Rio de Janeiro from Europe, six to eight per month; extra voyages as required; also direct to River Plate ports without calling here. This company has a fleet of over fifty steamers, and have, in addition to these, a great many chartered steamers. It is impossible to give more than a bare outline of their operations. The steamers arriving here and in Santos from Europe are generally sent homeward via United States ports in the absence of cargo in the Plate. Other steamers of the direct service are sent here also to be loaded for United States ports; if no cargo is obtainable, these latter proceed homeward in ballast. In addition to the above service a line subsidized by Belgium (fortnightly sailings) is run from Antwerp direct to the Plate, touching here on the homeward voyage. This line is intended for passengers, and can accommodate 50 to 60 first class, 30 to 40 second class, and 60 to 100 third class. But few of the other steamers have passenger accommodation, and in these it is limited. The cargo capacity of the steamers is from 2,500 to 5,000 tons. The company also operates coastwise from Rio de Janeiro to Rio Grande do Sul, Pelotas, and Porto Alegre, weekly sailings each way. No State aid except to the Belgian line. Freight, 25 to 40 shillings per ton.

(5) *Pacific Steam Navigation Company.*—From Liverpool to the west coast of South America, touching at Brazilian and River Plate ports both ways. The service is fortnightly from each end; sailing dates strictly observed; extra voyages as required. Their fleet is composed of nearly all new and magnificent steamers, and are larger than those of the Royal Mail Company. They operate on the west coast, coastwise, and to Australia also. Freight rate, 25 to 40 shillings per ton. Receives State aid.

(6) *Shaw, Savill & Albion Company, Limited.*—Monthly service from New Zealand to London, calling at Rio de Janeiro. These steamers are very fine and fast. Accommodation for 120 first-class, 100 second-class, and 300 third-class passengers; cargo, about 4,000 tons each. Freight rate, 30 to 40 shillings per ton. Receives State aid. Extra voyages when required.

(7) *New Zealand Shipping Company, Limited.*—Monthly service from New Zealand to London, touching at Rio de Janeiro. Steamers, etc., same as those above described. Freight rate, 30 to 40 shillings. Receives State aid.

(8) *Gulf line of steamers.*—From Liverpool and Antwerp for west coast of South America, touching here once or oftener per month as required. Small passenger accommodation. Cargo space, 3,000 to 3,500 tons each. No State aid.

GERMAN FLAG.

Hamburg-Südamerikanische Dampfschifffahrts-Gesellschaft.—Weekly sailings from Hamburg, calling at Brazilian ports as far as Santos; extra voyages as required; also six to eight sailings monthly direct to Plate ports; these latter call at Rio de Janeiro on the homeward voyages, thus giving from nine to twelve monthly homeward sailings from Rio de Janeiro. Fleet consists of thirty-five steamers, with cargo capacity of 2,000 to 3,000 tons each. Accommodations for 40 to 60 first-class, 30 second-class, and 100 to 200 third-class passengers. Freight rate, 25 to 30 shillings per ton. No State aid.

Robert Slowman Line, Hammonia.—From New York and Baltimore to Brazilian ports as far as Santos, returning to the United States, calling here and at other ports. Fleet consists of steamers with cargo capacity of 2,500 to 3,000 tons each; voyages each way as frequent as possible. No passenger accommodation. Freight rate, 25 to 35 shillings per ton. No State aid.

North German Lloyds.—Monthly and fortnightly sailings from Bremen and Antwerp, as demand requires, for Brazilian ports as far as Santos, and direct service to the Plate, the latter calling here on homeward voyages, thus giving two to four homeward sailings per month from Rio de Janeiro. Steamers accommodate 50 to 100 first-

class, 50 second-class, and 200 to 300 third-class passengers. Cargo capacity, 2,000 to 3,000 tons each. The company has a very large fleet, and operate in other directions also; they put extra steamers in this service as required. Freight rate, 25 to 30 shillings. Receives State aid.

ITALIAN FLAG.

Navigazione Generale Italiana, Società Reunita, Florio e Rubatino.—This company operates from Mediterranean ports in many directions. The service to Brazil and the River Plate is carried on by a very large fleet, which run direct to the Plate. Arrivals here from Europe are three to six per month, as required. Their fleet consists of about one hundred steamers. Can accommodate 50 to 200 first-class, 60 second-class, and 500 to 1,500 third-class passengers. Cargo capacity, 1,500 to 3,500 tons each. Freight rate, 20 to 30 shillings per ton. Receives State aid.

Company La Veloce.—From Mediterranean ports as far as Santos; also direct to Plate. Voyages, two to four per month, both ways, as required. Accommodations for 60 to 70 first-class, 50 second-class, and 600 to 1,500 third-class passengers. Freight rate, 20 to 30 shillings per ton. No State aid.

AUSTRIAN FLAG.

Austro-Hungarian Lloyds.—From Trieste as far as Santos. Regular monthly sailing, fortnightly when required, touching at Brazilian ports both ways. Can accommodate 40 to 100 first-class, 50 second-class, and 100 to 200 third-class passengers. Cargo capacity, 2,500 to 3,500 tons each. Freight rate, 25 to 35 shillings per ton. The company has a large fleet, and puts on steamers as needed. Receives State aid.

Adriatic Navigation Company.—From Fiume as far as Santos, regular monthly voyages, calling at Brazilian ports both ways; extra voyages when required. No passengers. Cargo capacity, 2,000 to 3,000 tons each. No State aid.

FRENCH FLAG.

Messageries Maritimes.—From Bordeaux to River Plate, fortnightly sailings from each end; sailing dates strictly observed; touching at Brazilian ports both ways; also direct service to the Plate. The fleet is composed of magnificent steamers making very rapid voyages. Can accommodate 200 to 300 first-class, 150 second-class, and 700 to 800 third-class passengers. Cargo space, 2,500 to 3,500 tons each. Operate to other parts of the world also; extra voyages as required. Freight rate, 30 to 40 shillings per ton. Receives State aid.

Compagnie Chargeurs Réunis.—From Havre as far as Santos, fortnightly sailings from each end, calling at Brazilian ports both ways; also direct to the Plate, these frequently calling here on homeward voyage; extra voyages as required; operate also to other ports. Can accommodate 50 to 70 first-class, 30 to 40 second-class, and 100 to 200 third-class passengers. Cargo capacity, 2,000 to 2,500 tons each. Freight rate, 25 to 35 shillings per ton. Receives State aid.

Société Générale des Transports Maritimes.—From Marseilles and other Mediterranean ports to the River Plate, calling at Brazilian ports outward and homeward; also direct to Rio de Janeiro and Santos. This company make voyages as frequently as possible, say, two to four times per month, and at times a greater number; they operate to other parts of the world also. Can accommodate 50 to 70 first-class, 24 to 40 second-class, and 700 to 1,500 third-class passengers. Cargo capacity, 2,000 to 3,500 tons each. Freight rate, 25 to 35 shillings per ton. Receives State aid.

BRAZILIAN FLAG.

Companhia Transatlantica Brazilina.—Just organized; will trade from Brazil to north of Europe and Mediterranean ports. Receives State aid.

Companhia Brazilina de Navigação á Vapor.—Three voyages per month as far as Manaos. Very fine and fast steamers; nearly all new. Receives State aid.

Companhia Nacional de Navegação á Vapor.—Frequent regular voyages to southern

ports of Empire and as far as Montevideo, also river service thence to upper Brazil; are constructing a number of new steamers. Receives State aid.

In addition to the three lines, the Government subsidizes a great number of smaller coast lines operating from here and other ports of the Empire.

AMERICAN FLAG.

United States and Brazil Mail Steamship Company.[1]—Voyages from New York to Santos, calling at Brazilian ports both ways. Number of sailings is about fifteen per annum. Fleet, three steamers. Cargo capacity, 2,500 to 3,000 tons each. Can accommodate 60 to 80 first-class and 60 third-class passengers. Freight rate, 25 to 35 shillings per ton. Receives State aid.

The Lamport & Holt Line, with the following vessels and points of destination:

To Pernambuco, Bahia, and Rio de Janeiro, steamers *Hevelius* and *Coleridge*.

To Santos, Paranagua, Desterro, and Rio Grande do Sul, steamer *Horrox*.

To Pernambuco and Rio, calling at Cabadello, Maceio, Victoria, and Santos if cargo offers. Goods taken for the Southern Brazil coast ports.

To Montevideo, Buenos Ayres, and Rosario. Goods taken for La Plata, Boca, San Nicolas, Colastine, and Bahia Blanca.

Prince Line, James Knott, Newcastle-on-Tyne, from New York to Pernambuco, Bahia, Rio and Santos. Goods taken for the southern Brazil coast ports. John C. Seager, general agent, 2 and 4 Stone street, New York.

Booth Steamship Company, Limited, under contract with the Brazilian Government, for Para, Maranham, and Ceara, and for Para and Manaos, via Barbados. Through bills of lading are issued via Manaos to Iquitos, Peru. Booth & Co., agents, 88 and 90 Gold street, New York.

Norton Line. Steam direct to the River Plate and River Plate to New York, via Rio de Janeiro and other Brazilian ports. Regular semimonthly service New York to Montevideo, Buenos Ayres, Rosario. Norton & Son, managers, New York. Bucknall Nephews, steamship owners, managers, London. Goods taken for La Plata, Colastine, San Nicolas, Bahia Blanca, etc.

United States and Brazil Line from New York and Baltimore. Regular steamers for Pernambuco, Rio de Janeiro, and Santos. Funch, Edye & Co., New York Produce Exchange Annex.

Northern Brazil mail steamers, Red Cross Line. For Para and Manaos, via Barbados. For Para, Maranham, and Ceara. Through bills of lading issued to Iquitos, Peru, via Manaos. For passage, freight rates, and other information, apply to Shipton Green, 113 to 117 Pearl street, New York.

Besides these steamship lines, Thomas Norton & Co., 104 Wall street, New York, have a line of packet vessels (sail) for Rio de Janeiro and Santos.

TRAMP STEAMERS.

In addition to the regular lines mentioned, this port is very much frequented by vast numbers of steamers arriving from many ports of the world, principally from Europe; recently quite a number have been coming with cargo from New York and Baltimore. These steamers are vulgarly known as "tramps," and all are, without exception, under the English flag.

I may here mention that the expenses of discharging cargo in this port, which is paid by steamers, amounts to 10 shillings and upward per ton.

Rates on coffee, which is about the only article shipped hence to the United States, will average about 25 cents per bag of 60 kilograms weight, and the expenses of loading same (for steamer's account) is about 14 cents per bag, this quite apart from charges in United States.

---

[1] This company went out of existence in 1893, and its service was replaced by that of the Lamport & Holt Line (British). The steamship lines at present plying between New York and Brazilian ports are:

BRAZILIAN VESSELS FOR COASTWISE TRADE.[1]

I transmit a copy and translation of decree No. 227, of December 5, 1894, postponing for two years the operation of decree No. 123, of November 1, 1892, which limits the coastwise trade of Brazil to Brazilian bottoms. I also transmit a copy and translation of the decree No. 123. You will observe that this trade will, upon the operation of the decree, be practically confined to vessels flying the Brazilian flag, except in the instances mentioned in articles 4 and 5. These exceptions are the transportation of goods belonging to the Government; transportation of passengers and their baggage, animals, valuable parcels, perishable agricultural and manufactured products and coin; to bring aid in cases of famine or pestilence; to trade generally in cases of foreign war. Foreign vessels are also permitted to enter ports for shelter or asylum, to discharge portions of a cargo at several ports, to take on cargo at several ports, and sell a cargo in cases of distress, shipwreck, or vis major.

THOMAS L. THOMPSON,
Minister.

DECREE NO. 123, OF NOVEMBER 11, 1892, REGULATING COASTWISE NAVIGATION.

[Translation.]

ARTICLE 1. Coastwise navigation can only be carried on in national vessels.

ART. 2. By coastwise navigation is meant direct communication or trade between the ports of the Republic, within its waters, and of the rivers that flow through its territory.

ART. 3. In order that a ship may be considered national, it is necessary (1) that it be the property of a Brazilian citizen or of a company or corporation with seat in Brazil, managed entirely by Brazilian citizens; (2) that it be navigated by a Brazilian captain or master; (3) that at least two-thirds of its crew be Brazilians.

ART. 4. Foreign vessels are prohibited from entering in the coastwise trade, under penalty of confiscation, but are permitted (1) to load or unload merchandise and articles belonging to the Government; (2) to enter a port for asylum and to leave for another with its cargo within a designated time; (3) to enter a port with a full cargo, and to leave for another with the same entire cargo or with part of it dispatched for consumption or reexportation; (4) to transport from one port to another of the Republic passengers of any class, their baggage, animals, and packages classified as valuable or perishable agricultural and manufactured products and coined valuables; (5) to receive from any or all the ports of the Republic manufactured goods or produce of the country for the purpose of exportation; (6) to bring aid to any State or point of the Republic in cases of famine, pestilence, or other calamity; (7) to carry any kind of cargo from one port to another of the Republic in cases of foreign war, internal commotion, injuries, and prejudice happening to national navigation and trade by cruisers and foreign forces, even if war has not been declared.

ART. 5. Merchandise taken from a port of the Republic can be sold in another, in cases of distress, shipwreck, or vis major.

ART. 6. The vessels of neighboring countries are permitted to navigate the rivers and interior waters according to the terms of the conventions and treaties.

ART. 7. Upon the enrollment of the vessels and crews, they will observe the rules of navigation and inspection which are designated in the regulation that the Executive power formulates for the execution of this law.

---

[1] Reprinted from Consular Reports No. 175, April, 1895, p. 573.

ART. 8. For five years after the publication of this law, the matriculation of all the personnel of the merchant marine is gratuitous, except the necessary stamps.

ART. 9. National vessels are obliged to have an inspection of the bottoms and machinery every six months, having the pipe and boilers subjected to a water pressure, and once a year the same inspection in a dry dock. These inspections will be gratuitous, and should be requested from the proper department by the proprietors, with eight days' notice; they can be made in any of the ports of the Republic designated in the regulation which will shortly be expedited.

ART. 10. The provisions of this law will not take effect until two years after the publication.

ART. 11. All provisions to the contrary are revoked.

DECREE NO. 227, OF DECEMBER 5, 1894.

[Translation.]

ARTICLE 1. It is decided to prolong the time two years in order that the vessels which carry on the coastwise trade between the sea and river ports of the country may be nationalized in accordance with the provisions of law No. 123, of November 11, 1892.

ART. 2. Revoke all laws to the contrary.

RAILWAYS.

In 1893, the Government of Uruguay issued a large volume, entitled a Treatise on the South American Railways, compiled by Señor Juan José Castro, under direction of the minister of public works. The following information concerning the railways of Brazil is compiled from it:

The railways of Brazil are divided into three groups, namely: The Northern, the Central, and the Southern. The first lies within the States of Rio Grande del Norte, Parahiba, Pernambuco, Alagoas, Sergipe, and Bahia; the second in the States of Minas Geraes, Rio Janeiro, and Sao Paulo; and the third in the State of Rio Grande do Sul. "In each one of the nuclei of railway networks," says Señor Castro, "the lines generally are of local importance and of 1 meter gauge, although, however, some by the conditions and directions are destined to serve the general public traffic, among which we might cite the line from Recife to Sao Francisco in the future it would have when incorporated with the Interoceanic line in the State of Pernambuco; the Central Brazilian Railway; the Santos and Jundiahy Railway; and the principal line of Mogyana in the extensions proposed connecting with the lines running through the States of Goyaz and Matto Grosso as far as the Bolivian frontier."

Among the lines projected which may be regarded as international in character, Señor Castro mentions that of Santos; that from Sao Francisco to the Paraguayan frontier; and that from Recife to Valparaiso "which ceases to be a line of mere Brazilian importance when considered as of South American international character."

In 1852 the Brazilian Government adopted a law providing guarantees and inducements for railway construction. At the present time there are in Brazil 11,043 kilometers (6,862 miles) of railway in working

order; 5,402 (3,357 miles) under construction; 5,175 (3,216 miles) surveyed; 4,414 (2,743 miles) being surveyed, and 13,826 (8,591 miles) yet to be surveyed.

"In view of the enormous size of Brazil," remarks Señor Castro, "and of its extensive coasts being provided with excellent ports, the first necessity was to open to each district its most natural and shortest exit toward the sea, without considering that at some more or less distant date these arteries might become united and form one single network; in this manner were established the three systems which we have indicated in order to meet the demands of the exporting and importing commerce of the interior of the country, affording an easy exit through its principal ports, which in the northern district are Pernambuco and Bahia; in the central district, Victoria, Rio de Janeiro, and Santos, and in the southern, the mouth of the Rio Grande do Sul, its only exit to the Atlantic Ocean, and which is very badly qualified to serve the commerce of that state, whose wants are chiefly supplied through the port of Montevideo and those of the River Uruguay (Salto and Concordia).

"The population of Brazil, already some 15,500,000 souls, its enormous products and commerce, show the necessity for rapid and cheap communication between its states and the interunion of these three independent systems of railways, and to gain this end, which will be of the greatest importance to Brazil, for many reasons, the public powers are allying themselves with private enterprise."

Señor Castro supplies the following table of Brazilian railways actually working in 1892:

Railways.	Length.	Railways.	Length.
State:	*Kilometers.*[1]	Guaranteed by the State—Cont'd:	*Kilometers.*[1]
Baturite	197.6	Lepoldina	1,471
Comocin-Sobral-Ypu	216.6	Minas and Rio	170
Central Pernambuco	72.1	Western Minas	377
Palmares to Sao Francisco	146.4	Juiz de Fora to Piau	61
Paulo Affonso	115.9	S. Isabel of the Rio Preto	74.5
Alagoinhas to Sao Francisco	322	Rosendo Areas	28.4
Rio d'Ouro	83	Central Macahe	44
S. Amaro Jacu	36	Ribeirao to Bonito	32
Central Brazilian	225	Mogyana (main line, 1887)	740
Central Brazilian	394	Bragantina	52
P. Alegre to Uruguayana	377	Sorocabana	376
Guaranteed by the State:		Paranaguа-Curityba-Lapa	231
Natal to Nova Cruz	121	Thereza Christina	116
Conde d'Eu	141	Rio Grande to Bage	283
Recife-Palamare	124.7	Quarahim to Itaqui	173
Recife-Limoeiro-Tinbauba	141.1	Unguaranteed:	
Riberao to Bonito	22	Recife-Caxanga	20
Maceio-Imperatriz	150	Macahe-Campos	96
Bahia-Alagoinhas	123.3	Santo Antonio de Padua	92.7
Alagoinhas-Timbo	83	Rio de Janeiro to Mage	88
Central Bahia	315	Principe do G. Para	91.7
Nazareth Santo Antonio	34	Santos to Jundiahy	139
Nazareth Tram Road	42	Ituana (1886)	283
Carravellas Philadelphia (1887)	142	Paulista	242
Itapemirim Alegre	70	Rio Claro	264

[1] Kilometer—0.6214 miles.

The most important of the Brazilian railway lines is the Central Brazilian Railway, which has become the artery for the great system of

railway lines converging from right to left toward its own, "which," says Señor Castro, "makes it what the law of 1852 intended it to be, namely, the great factor in the development of the States of Rio de Janeiro, Minas Geraes, and Sao Paulo."

According to a report from the British legation, November 7, 1893 (No. 1321 British Foreign Office Reports, annual series), the number of miles of railroad in Brazil then open for traffic was 6,651; under construction, 3,185; under survey, 5,340; to be surveyed, 9,071.

INTERIOR TRANSPORTATION.

Besides the railroads, the means of interior transportation in Brazil are steamboats and other craft on the rivers, pack horses, and mules. Consul Burke, of Pernambuco, writing in November, 1893 (see Consular Reports No. 160, p. 51), says: "Goods are shipped to the interior by railway, by boats up small steams and rivers, and by pack horses and mules. When it is known that the railway mileage of the entire State of Pernambuco (which is nearly as large as the State of Kansas) is not above 450 miles, it may be inferred that most of the goods to the interior are carried by pack horses or mules. Goods go by train or water to the town on railway or river nearest to the interior towns to which the goods are destined, and are thence transported by pack horses or mules to their destination. It will thus be seen that the pack horse or mule is very largely the motive power of the State.

"A pack horse or mule usually carries from 60 to 80 kilograms (135 to 200 pounds) of weight. If the goods are bulky the weight is less. The box or case in which such goods are put up is from 1½ to 2 feet in length and from 1 to 1½ feet in depth and width, depending, of course, upon the weight, character, and bulkiness of the goods. Two cases are thus carried, one on each side of the horse or mule. The goods are securely fastened and covered with oilcloth."

HIGHWAYS.

In another report from Consul Burke, dated January 20, 1891, from Bahia, printed in Special Consular Reports, "Streets and Highways" (p. 469), the following information about the means of land communication, besides railroads, in Brazil is given:

There are no country roads, and but very little can be said of "city streets."

Communication between towns, where there are no railways to the interior, is by water in small boats or canoes, or by bridle paths on donkeys, mules, or horseback. To go in a carriage of any description 5, 10, 20, 40, or any number of miles, few or many, into the interior, is a thing unheard of and unknown; and this for two very good reasons, viz: First, there are no roads for a carriage, and in the second place, there are no carriages, excepting those owned by livery-stable proprietors, and these are rarely used except for funerals, weddings, and baptisms.

In this city of 200,000 inhabitants, perhaps, there are not over five families that have their own turnout. All the merchandise sent from this city to the interior of the State must be taken to some seaport in small craft and then sent by rail, by river, by donkey, mule, or horse to its destination. Very little is sent by rail, as the number of miles of railway in this State and Sergipe is very limited, so that nearly all the merchandise imported, as well as the exported products, must be taken by water up or down the river, and by donkey or mule, simply because there are no roads.

From the city of Bahia to the southwestern part of the State it requires at least thirty days to make the journey. The journey by rail is 450 kilometers (280 miles), thence by horse or muleback to the San Francisco River, up the river in a small boat, then again by mule, donkey, or horseback till the town in the interior is reached.

Some idea of the difficulties and vexatious delays in traveling in this country may be obtained when it is known that to cover a distance some 200 miles less than from New York to Chicago (twenty-four hours), it takes thirty days in this district—days of discomfort not only in the actual traveling, but also in the eating, drinking, and sleeping. The people are very hospitable, so it is not from this cause the discomfort in traveling arises. It is simply because actual comfort in going from town to town, such as one finds in the States, has never existed here; consequently neither the country nor the people can give what it has not. When one leaves the rail or the boat he simply mounts his horse, mule, or donkey, having provided a guide, if not familiar with the country, and follows the trail, for it is nothing more, till he reaches his destination.

Women who find it necessary to travel must adapt themselves to the same conditions as the men.

RIVER SYSTEM.[1]

The main dependence of Brazil for interior transportation is her river system. Some idea may be formed of the extent of this system of internal waterways, by observing on the map the interlacement of the head waters of the southern affluents of the Amazon, on the central plateau of Matto Grosso, with those of the Paraguay flowing to the south. By means of a small canal, which the Portuguese attempted to cut in the last century, a flat-bottomed boat might pass from the mouth of the Rio de la Plata to the mouth of the Amazon through the rivers of this unique system. Brazil has none of the great lakes characteristic of North America, but in the size and importance of its rivers it has no rival in the world.

The river system of Brazil naturally resolves itself into three subdivisions: That of the Amazon, or northern; the Sao Francisco, or

[1] Compiled from Handbook of Brazil, printed by the Bureau of the American Republics, 1891.

eastern, and the Parana, or southern. There are many rivers, some of them of considerable size, that empty into the Atlantic between the mouths of the three great rivers which give their names to the three subdivisions of the general system; but by far the greater part of the waters drained from the three great watersheds of Brazil find their way to the ocean through the channels of the three above named.

The possibilities of the navigation of the Amazon and its affluents have only begun to be developed, and yet the following "magnificent distances" are navigated already by steamers: From Belem (Para) to Manaos, 1,100 miles; Manaos to Iquitos, Peru, by River Solimoes, 1,350 miles; Manaos to Santa Isabella, by River Negro, 470 miles; Manaos to Hyutanahan, by River Purus, 1,080 miles; Manaos to Sao Antonio, by River Medeira, 470 miles; Belem to Bayao, by River Tocantins, 156 miles; Leopoldina to Santa Maria, 570 miles; making a total of 5,196 miles of steam navigation on the Amazon and its southern affluents; and this total does not include the navigation of the branches of the above-named rivers, which would increase the amount by some 3,000 miles more.

The great river, Sao Francisco, has its source near Ouro Preto, the capital of the State of Minas Geraes, in latitude 20° south; runs north and east to latitude 9° south, where it turns to the southeast, pours its floods over the wonderful falls of Paulo Affonso, and empties into the Atlantic in latitude 10° 45″ south. Above the falls the river is navigated for hundreds of miles by steamers, and from the sea to the falls by larger vessels. Its western affluents mingle their fountains with the sources of the branches of the Tocantins, so that, in many places, but a short distance separates the waters that seek the Amazon to the north and those that reach the Atlantic through the Sao Francisco. A remarkable feature of the Brazilian river system is the commingling of the sources of the affluents of the three subdivisions, which will admit passage from one to the other by boats by cutting short canals, in many cases without the necessity of locks between their head waters.

The River Parana, the main stream of the southern subdivision, receives the waters of its northern affluents from the State of Minas Geraes, where they rise among the sources of those of the Sao Francisco. Its water are navigable by large steamers up to the falls of Guayra, on the western border of the State of Parana, and above these by smaller ones through more than 700 miles. This river receives the waters of the Paraguay, whose sources are in the center of Matto Grosso, near those of the Tapajos, an affluent of the Amazon. The Paraguay is also navigable by steamers from Montevideo for over 2,000 miles; and this is the route taken by troops and passengers from Rio de Janeiro for the capital of Matto Grosso, Cuyaba, which is situated on one of the affluents of the Paraguay.

WATER TRANSPORTATION IN PERNAMBUCO.[1]

No canals exist in this consular district nor are any to be built here for some time to come; in fact I do not think that canals will ever be of any use here, owing to the formation of the land and the want of lakes or rivers which could be joined by canals to the great advantage of traffic or commerce, and canals for the purpose of irrigation are not needed in a country where the annual rainfall at times reaches between 80 and 90 inches.

All traffic is carried on here by very primitive river craft, called barcassos, and said craft are also used to do coasting business, because they are protected by a coral reef which encircles the coast of this whole consular district, with occasional openings to admit ingress or egress to and from the ocean. This coral reef is about one-half of a mile from the mainland and forms a mighty barrier against the encroachment of the ocean upon the land, and offers these barcassos the protection of a river.

In the interior, traffic is carried on by horses. They have the merchandise slung on each side of them; they rest in the middle of the day and travel at night, making only a short stop at midnight. This requires constant loading and unloading of the merchandise, and I would respectfully say just here that the American exporters sometimes lose sight of this fact and export their goods in such frail packages that they will not bear the handling on a long journey of that sort, and are, therefore, not so readily sold as European goods, made where the exporters are aware how goods reach the interior.

ECUADOR.

OCEAN LINES.

The great "ocean lines" to and from Guayaquil are: Two lines from Panama to Valparaiso, touching at Guayaquil—the Pacific Steam Navigation Company (an English corporation), and the Compañía Sud-Americana de Vapores (a Chilean corporation). Each has on its line five first-class steamships, of 3,000 tons each. They are all admirably fitted up for both passengers and freight, and are lighted by electricity. These lines carry the foreign mails, and a vessel of each leaves Guayaquil, going north and south every week, and leaving Valparaiso on alternate weeks. None of these vessels touch at other Colombian ports, or at other ports of Ecuador than Guayaquil, but the Pacific Steam Navigation Company has two steamships which ply between Guayaquil and Panama, touching at all the ports of Ecuador north of Guayaquil and at those of Colombia on the Pacific. These carry passengers and

---

[1] Extract from report of Consul Borstel, of Pernambuco, October 14, 1889; reprinted from Special Consular Reports, "Canals and Irrigation."

freight, and the coast mails; the service is fortnightly. All the steamships of these lines are supplied with side hatches and steam windlasses, and it is said that steamships without these time and labor saving appliances can not successfully compete with those which have them.

The English and Chilean lines, long in competition, finally came to the present arrangement: The English and Chilean steamers leave Valparaiso on alternate weeks, and thus there is an English or Chilean steamship touching at Guayaquil, going north every Saturday and south every Monday.

First-class passage: From Panama to Guayaquil, £13 15s. ($66.90); Guayaquil to Valparaiso, £20 3s. 6d. ($99.14); Guayaquil to Callao, £8 10s. ($41.36); Panama to Valparaiso, £30 15s. ($149.63).

Freight charge from Guayaquil to Colombian Pacific ports, including Panama, is 9 sucres[1] ($4.62) and 25 per cent additional; to Ecuadorian ports, 7 sucres ($3.65) and 25 per cent; to Peruvian ports, 12 sucres ($6.15) and 25 per cent; to Chilean ports, 15 sucres ($7.69) and 25 per cent.

The distance as sailed from Panama to Guayaquil is 815 miles; from Guayaquil to Callao, 740, and from Guayaquil to Valparaiso, 1,430.

Agents at Guayaquil: Pacific Steam Navigation Company, George Chambers & Co.; Compañía Sud-Americana de Vapores, Seminario Hermanos.

Guayaquil has splendid ocean service to Europe, through the Straits of Magellan, and has one line to New York, the Merchants' Line. There are four lines of steamships, each having a steamer arrive at Guayaquil regularly once a month from England or the Continent.

(1) *Gulf Line.*—The Greenock Steamship Company, an English corporation, called the "Gulf Line," has sixteen steamships in the service, ranging from 1,600 to 3,500 tons register. They are lighted by electricity and fitted to carry passengers and freight. They ply between Guayaquil and Liverpool, Glasgow, and Greenock. The first-class passenger fare from Guayaquil to Liverpool is £50 ($243.30). Freight per ton is about £2 ($9.73). These steamers also go to Hamburg and Antwerp. Guayaquil agents, Martin Reinberg & Co.

(2) *Hamburg-Pacific Steamship Line* (*Hamburg-Pacific Dampfschiffs-Linis*).—These vessels ply between Guayaquil and Hamburg and Antwerp. There are eleven steamships on this line, ranging from 3,000 to 5,000 tons register. They are fitted out specially for cargo, but each can carry from sixteen to twenty first-class passengers. Their regular trips are from Hamburg and Antwerp, but occasionally they touch at Genoa and Cadiz; and on the Pacific coast they make all the principal ports from Valparaiso to San Jose de Guatemala. On the return trip they rarely touch at Guayaquil (they may be signaled at

---

[1] The sucre is worth to-day 51.28 cents in American gold. The value fluctuates with the rise and fall of exchange.

San Jose to call there), but call at the northern ports of Ecuador, where they take large quantities of ivory nuts (tagua) to Germany. Passenger rates to Hamburg and other points are made specially, no regular tariff. Freight per ton: for ivory nuts, £2 ($9.73); for cacao, £2 10s. ($12.77), and other freights assimilated. Guayaquil agents, Successors of Daniel Lopez.

(3) *French Pacific Line* (*Ligne Française du Pacifique*).—This line comprises two French companies, that of the Maritime du Pacifique and Havraise Péninsulaire de Navigation à Vapeur. There are at present nine steamships on this line, ranging from 3,500 to 5,000 tons register, and from 1,800 to 2,000 horsepower. This line plies between Havre and the Pacific ports of South and Central America, making all ports, great and small, of Chile and Peru, from Punta Arenas (in the Straits of Magellan) to Payta, in Peru, and Guayaquil; thence to San Jose de Guatemala, and finally Puntas Arenas, Costa Rica; Corinto, San Juan del Sur, La Union, Amapala, La Libertad, and Acajutla. They touch at Bordeaux and Liverpool. Guayaquil agents, Reyre Bros. & Co.

(4) *Pacific Steam Navigation Company*.—This company has eight first-class steamships on its line from Liverpool to Valparaiso, connecting with its own and the Chilean steamers from Valparaiso to Guayaquil and Panama twice a month. The steamships of this line are each of 6,000 tons register, admirably fitted up, as is the case with the other steamers of this company, for both passengers and freight. They carry the foreign mails, and touch at the Atlantic ports of South America, at Rio Janeiro and south; they touch at Lisbon and sometimes at Vigo, Spain.

(5) *Kosmos Line*.—There is another German fleet of steamships, composing the Kosmos Line (Deutsche Dampfschifffahrts-Gesellschaft Kosmos), of fifteen steamers, ranging from 1,700 to 3,000 tons register, and making somewhat irregular connections at Guayaquil about once a month from Hamburg, and coming through the Straits, generally make all the ports on the Pacific. Guayaquil agents, E. Rohde & Co.

(6) *Merchants' Line*.—This line has four steamships plying between New York and Guayaquil. The service is somewhat irregular—once a month or once in two months. One of the steamships is of 2,067 tons register, and the others somewhat over 3,000 tons. They are English ships, chartered by W. R. Grace & Co., of New York, and the Guayaquil agents are E. Rohde & Co.

COMMUNICATION WITH THE INTERIOR.

As to "railways," "navigable rivers and canals," and "first-class highways," there are none in Ecuador worth mention, except for local traffic and travel. To get to Quito and the interior, there are two principal routes. The best is by steamboat, daily, to Bodegas (Babahoyo), eight hours; and there take mules to the interior. The other route is

to take the railroad to Chimbo, 50 miles, and there take mules. There is but one piece of what may be called "highway" in the Republic of Ecuador. From Ambato to Quito there is a stage line which takes up the mule-backers at Ambato and gives them a fairly good drive to Quito, 60 to 70 miles, in about eighteen to twenty hours. This is the only carriage road in the Republic outside of the cities, and was built by Garcia Mareno. The old highway of the Incas, from Quito to Cuzco, has long since gone to ruin, whatever may have been its character. The whole of the commerce of this great seaport with the interior mountain country goes on muleback by one of the routes named. The commerce of the great valley in which Guayaquil is situated is carried on by the steamboats and lesser craft of sail or oar on the almost innumerable rivers and esteros (creeks or bayous) which intersect it in almost every direction, and by the railroad which taps the principal sugar-growing district.

A part of this, the only railroad in Ecuador, may be mentioned on account of overcoming great obstacles in construction. That part of it, from Duran (the terminus just across the river from Guayaquil) to Yagauchi, about 20 miles, is constructed through the tembladeros (a succession of lagoons and marshes, called on the old English maps "The Great Yaguachi Lagoon"), which are without consistent soil and overflowed by the tides flowing up the River Guayos from the Gulf of Guayaquil, 35 miles distant. Only a small part of the roadbed is on dry land, and that in the tembladeros had to be constructed of rock carried from the Capra hills, at Duran. The rock was filled in until it ceased to sink, and now appears to be stationary and solid. The railroad is operated by the Government, having been taken from the contractor, Kelly, who, after building the railroad through the lagoons, failed to comply, it is said, with his contract in extending the railroad from Chimbo to Sibambi, in the direction of Quito. Manager of the railroad, Señor Don Juan G. Sanchez.

GEO. G. DILLARD,
Consul-General.

GUAYAQUIL, *July 6, 1894.*

PERU.

RAILWAYS.

In consideration of the cancellation of the foreign debt of Peru, with the exception of the line to Moquegua, the entire railway system was turned over by the Government to the Peruvian Corporation, an English company, for a period of sixty years from date of contract. This system is as follows:

	Miles
Paita to Piura (broad gauge)	59.28
Paita to intermediate stations:	
To Huaca	18.6
To Nomara	23.13
To Sullano	38.5
Pacasmayo to Yonan Guadelupe (broad gauge)	57.17
Pacasmayo to intermediate stations:	
To San Pedro	4.97
To Calasnique	8.21
To Cultambo	14.29
To Chafan	15.53
To Chepen	23.21
To Tolton	24.05
To Pay Pay	27.45
To Monte Grande	34.58
Salaverry to Ascope (narrow gauge)	47.22
Salaverry to intermediate stations:	
To Trujillo	4.63
To Chicama	8.85
To Chocope	29.20
Chimbote to Suchiman (narrow gauge)	32.37
Chimbote to intermediate stations:	
To Rinconada	13.67
To Vinsos	20.50
Lima to Ancon (broad gauge)	23.61
Lima to intermediate stations:	
To Reparticion	5.28
To Infantas	8.07
To Puente Piedra	13.36
Callao to La Oroya (broad gauge)	133.83
Callao to intermediate stations:	
To Montserrate	8.07
To Santa Clara	18.39
To Chosica	33.55
To San Bartolome	47.22
To Surco	56.54
To Matucana	64
To San Mateo	77.98
To Chicala	86.38
Pisco to Ica (broad gauge)	45.98
Pisco to intermediate stations:	
To Mille Diez y Ocho	18.02
To Guadelupe	38.52
Mollendo to Arequipa (broad gauge)	106.88
Mollendo to intermediate stations:	
To Mejia	11.71
To Tambo	19

	Miles.
Mollendo to Arequipa—Cont'd.	
Mollendo to intermediate stations:	
To Cachendo	34.74
To Joya	54
To Vitor	75.91
To Tingo	104.95
Arequipa to Puno (broad gauge)	217.49
Arequipa to intermediate stations:	
To Yura	18
To Vincocaya	95.98
To Crucer Alto	117.98
To Maravillas	155.22
To Juliaca	188.96
Juliaca to Marangani (broad gauge)	116.82
Juliaca to intermediate stations:	
To Pucara	34.79
To Santa Rosa	82.02
Eten to Ferrenafe-Petapo (broad gauge)	48.46
Eten to intermediate stations:	
To Pueblo Eten	2.05
To Monsefu	4.10
To Chiclayo	11.74
To Lambayeque	19.44
To Ferrenafe	29.82
To Pomalca	18.57
To El Combo	21.68
To Tuman	24.79
Pimentel to Lambayeque (narrow gauge)	14.91
Pimentel to intermediate stations:	
To Chiclayo	8.70
Lima to Callao (broad gauge)	8.51
Lima to intermediate stations:	
To Salud	3.10
To Legua	4.77
To Bella Vista	6.44
To Mercado (Callao)	7.15
To Santa Rosa	7.47
To Chucuito	8.07
Lima to Chorillos (broad gauge)	8.69
Lima to intermediate stations:	
To Miraflora	4.84
To Barranco	7.08
To Buen Pastor	8.37
To Chorillos Station	8.26
To Chorillos (Tornamesa)	8.82
Lima to Magdalena (broad gauge)	3.72
Arica to Tacna (broad gauge)	39.14
Total length of railways	**917.46**

Passenger rates (first class).

From—	To—	Miles.	Fare.
			Sols.[1] *Dollars.*
Lima	Callao	8.51	0.40 = 0.1904
Lima	Chorillos	8.69	.40 = .1904
Callao	La Oroya	133.83	11.10 = 5.2685
Lima	Ancou	23.61	1.60 = .76
Paita	Piura	59.28	2.96 = 1.406
Puno	Arequipa	217.49	14.00 = 6.65
Puno	Ensenada	.....	20.00 = 9.50
Pimentel	Lambayeque	14.91	.60 = .285
Pisco	Ica	45.98	2.40 = 1.14

[1] Average value of sol in 1894, as per United States Mint valuation, 47.50 cents.

For illustration, the general schedule of freight rates of the Paita and Piura Railway and that of the principal route the famous Peruvian Central Railway (Ferrocarril Central del Peru), are given, as follows: Paita and Piura Railway, 97 kilometers. (59.28 miles), first class, 7 centavos per cubic meter per kilometer (3.325 cents per 35.316 cubic feet per 0.62137 of a mile); second class, 5 centavos (2.375 cents); third class, 10 centavos per ton of 1,000 kilos per kilometer (4.75 cents per ton of 2,204.6 pounds); fourth class, 8 centavos (3.8 cents); fifth class, 2½ centavos (1.187 cents).

THE PERUVIAN CENTRAL RAILWAY.

The Peruvian Central Railway is justly regarded as one of the most marvelous achievements in railway engineering in the world. For a distance of 106 miles, starting at Callao, this road rises continuously from a plane of 8 feet 7 inches above sea level to the snow-capped summit of the Andes, which it crosses at the altitude of 15,665 feet. The line runs through a series of mountain gorges and along the banks of the cascades of the Rimac River. The precipitous slopes, which are now barren, and the abodes of the vicuña and the llama, were in the days of the ancient empire of the Incas, terraced and kept in a high state of cultivation by the Peruvians. The traces of this terracing remain and are plainly visible. The Peruvians are content nowadays to cultivate the narrow vales skirting the Rimac, and their little chacras (farms) add interest to the picturesqueness of the route. The road makes numerous zigzags along the mountain slopes, crosses deep chasms, and passes through numberless tunnels. On the eastern slopes of the Andes, the scenery and climate undergo a complete change, and at Oroya, the present terminus, which is 12,178 feet above sea level, the traveler feels that he is almost in sight of the tropical vegetation of the boundless plains of the Amazon. He is in reach of the promised land of the picturesque Montana, with its varied climates, products, flora, forestry, and animal life. In imagination, he sees the Peru of the future, when the immigrants will have dotted the plains watered by the Amazon and its tributaries with fields of sugar cane, coca, coffee, tobacco, cotton, and numerous cereals, and other valuable plants.

The following itinerary will give an idea of the grandeur of the Peruvian Central Railway, starting from Callao:

Stations.	Distances from Callao.		Elevation.
	Kilometers.	*Miles.*	*Feet.*
Callao	0.0	0.0	8.7
Callao Shops	1.4	.9	.....
La Legua	6.9	4.3	.....
Lima, Monserrate	12.4	7.7	499.9
Lima, La Palma	13	8.1	.....
Lima, Desamparados	13.5	8.4	.....
Lima, Viterbo	14.5	9	.....
Santa Clara	29	18	1,311.7
Chosica	53.4	33.2	2,800.6
Puruay Bridge	64.8	40.3	.....
Corcona Bridge	65.7	40.8	.....
Cochachacra	72.4	45	4,622.6
San Bartolome and V	75.8	47.1	4,959.4
Verrugas Bridge	83.5	51.9	5,839.4
Cuesta Blanca Tunnel	85	52.8	6,001.1
Surco	89.9	55.9	6,660.9
Challapa Bridge	98.4	61.1	7,504.1
Matucana	102.3	63.6	7,788.8
Quebrada Negra Bridge	105.4	65.5	8,054.1
Tambo de Viso Bridge	110.7	68.8	8,706.5
Chaupichaca Bridge	117.5	73	9,472.6
Tamboraque and V	120.6	74.9	9,826.9
Aruri and V	122.8	76.3	10,094.5
San Mateo	126.3	78.5	10,534.1
Infiernillo Bridge	129.4	80.4	10,919.9
Cacray, double V	130.3	81	11,033.1
Anchi Bridge	132.7	82.5	11,366.4
Copa Bridge	135.5	84.2	11,638.8
Chicla, lower V	140.4	87.2	12,215.5
Chicla, upper V	144.8	90	12,697.1
Casapalca	152.9	95	13,606.2
Paso de Galera Tunnel (highest point on the line)	170.7	106.1	15,665.2
Yauli	193.2	120.1	13,420.8
Oroya	219.6	136.5	12,178.7

The railways of Peru were made under contracts executed by an American, Henry Meiggs, a man endowed with indomitable energy, courage, and perseverance. Henry Meiggs was broadly liberal in his dealings. "There was nothing small about him," it is said. He was a fine judge of men, as his selections of subordinates have proved. His liberal instincts led him to return benefits to the country which had bestowed benefits upon him, and he has left standing several works illustrating his public-spiritedness and gratitude to Peru. His memory is revered by Peruvians, and they have given the name Monte Meiggs to the Andean peak whose crest rises 17,575 feet above sea level and at whose base is the famous Galera tunnel, which pierces the Andes at the altitude of 15,665 feet.

The name of another American, William Henry Cilley, is associated with the fame of Henry Meiggs. The rôle played by Cilley in the colossal engineering achievements which make the line from Callao to La Oroya perhaps the most wonderful in the world, and to behold which is worth coming to Peru from distant lands, is thus narrated by Mr. A. D. Hodges, jr., in his obituary notice of Mr. Cilley:

> Henry Meiggs having taken contracts with the Peruvian Government for an extensive system of railroads, Mr. Cilley went to Peru in 1870, and in 1871, began the work on the Pacasmayo road. Hardly had he got matters there well organized, when he

was called to take charge of the famous Oroya road, where difficulties had been encountered which threatened to become insurmountable. But Mr. Meiggs had staked his reputation on the building of this road, and turned to Mr. Cilley as the one who of all men was best fitted for the task.

The laborers, who were foreign importations, generally of the toughest classes, were dying by hundreds of the Verrugas fever. Many of the engineers were disheartened and afraid to reside on the line. Jealousies were rampant. Food, tools, powder, everything, in short, had to be brought from other countries and then transported over miles of dangerous trails on the backs of animals. The natural obstacles were so unusually great, even for South America, that the ablest engineers obtainable had pronounced the construction of the road beyond San Bartolome a practical impossibility. With some misgivings, Mr. Cilley assumed the charge. He built hospitals, established the camps in the most healthful localities, organized his forces, and was ever the foremost in positions of danger and difficulty. Day and night, he labored with an energy impossible to small men. He often went for weeks without sleeping in a bed, and for months without more than two or three hours rest out of twenty-four. Fresh obstacles were met with fresh resources and daring inventions. The Verrugas bridge, with central pier 252 feet high, was erected without false works and without a single casualty. The Horseshoe tunnel was run in a circle in the solid mountain simply to gain grade, an idea more fully developed afterwards in the "spiral" tunnels of the Saint Gothard road. The long Galera tunnel was perforated at an elevation of nearly 16,000 feet above the sea. The roadbed and tunnels were completed almost to Oroya. The construction, carried on under unparalleled difficulties, cost less per mile of finished road than the more easily built sections below San Bartolome. The history of the world records no equal feat in railroad building.

OCEAN LINES.

Regarding the ocean traffic with Europe by way of the Straits of Magellan, a distance of between 14,000 and 15,000 miles, the purposes of this report will be sufficiently attained by noting the arrivals of steamships at the port of Callao during 1894, which were as follows: Hamburg, 31 steamships, with a total registered tonnage of 53,075; Liverpool, 29 steamships, with a total registered tonnage of 55,300; Havre, 9 steamships, with a total registered tonnage of 20,444. These vessels are fitted out mainly to carry cargoes, and their accommodations for passengers are limited. Their agents here do not furnish freight schedules and seem loth to give rates except to shippers applying to them for business purposes.

Of prime importance to the United States is the ocean route between Panama and Valparaiso. This route is monopolized by the Pacific Steam Navigation Company (English) and the Compañía Sud-Americana de Vapores (Chilean) in combination. They bring five mails every two months from the United States at irregular intervals of one and two weeks, respectively. Each of these companies runs a steamship every alternating week to Panama and return to Valparaiso, and another steamship to Pimentel, Peru, in like manner, touching at intermediate ports and making stoppages of from three to four days each way at Callao. This gives to each company eight steamships in active operation. They are excellent vessels, capable of making the voyages

in less than half the time they occupy, and are specially built in England for this trade. In point of accommodations for passengers they combine the comforts of the old floating palaces of the Mississippi, the Sound steamers, and the ordinary ocean steamship. They have upper-deck staterooms and upper-deck promenades. The route is perhaps the most uniformly smooth and pleasant in the world, and cheap rates would make it a favorite one for the tourist. A voyage on one of these steamships is usually one of little risk, and of much pleasure and comfort. Their officers are courteous, capable, and careful men, and they seek in every way to please the traveler. The registered tonnage of these vessels will average 1,500. At Panama they connect with the Pacific Mail steamships to San Francisco and across the Isthmus; at Colon, with steamships to New York, New Orleans (one way), and with principal European ports. At Valparaiso connection is made with steamships of the Pacific Steam Navigation Company in the direct trade with Europe by the Straits of Magellan.

The Pacific Steam Navigation Company was founded in the forties by William Wheelwright, an American, at one time United States consul at Guayaquil, Ecuador. Mr. Wheelwright having failed to interest American capitalists in the undertaking, went to London, and, after years of hard labor, succeeded. Two paddle-wheel steamships of a few hundred tons burden were the pioneers of the present line, which is one of the richest and most powerful in the world. The Chilean company was started in competition and for a while rates went down. Concluding that both lines would stay, their directors came to terms and, as might be expected, to the great injury of the helpless people of this coast. The effect of the combination upon the progress and development of the marvelous resources of these countries may well be imagined.

Both companies are prospering, and recently the Chilean company has added to its superb fleet the *Loa*, a magnificent vessel.

The following schedules of rates furnish the explanation for the absence of American trade in these parts and for the steady decrease of American residents:

Passage rates (first class): From Callao to Guayaquil, 702 miles, £5 10s. ($26.76); to Panama, 1,537 miles, £17 10s. ($85.15); to Valparaiso, 1,271 miles, £11 17s. ($57.67). Steerage: From Callao to Panama, $28.73; from Panama to Guayaquil, 835 miles, £8 10s. ($41.36); from Panama to Callao, 1,537 miles, £20 ($97.32); from Valparaiso to Callao, 1,271 miles, £11 5s. ($54.74).

By direct route the distance from Panama to Callao is 1,340 miles, and from Panama to Valparaiso, 2,611 miles. The steamers take from seven to eight days to make the voyage from Panama to Callao. At Callao they make a stay of three or four days. It then takes them from seven to nine days to go from Callao to Valparaiso.

New Orleans is 1,370 miles from Colon, and New York 2,025. Either port, therefore, is no farther from Callao than is Liverpool from New York. The voyage between the two last-named ports across the Atlantic is easily made in seven days. Valparaiso being but 1,271 miles from Callao, and San Francisco but 3,200 miles from Panama, the possibilities open to American enterprise on this coast, when it is borne in mind that its trade goes almost bodily by way of the Straits of Magellan to Europe, over stormy routes of from 14,000 to 16,000 miles, can be easily perceived.

Freights from Panama to Callao.

	Sols.	Dollars.
Rice, sacks of 190 pounds, each	1.20 =	0.57
Rice, sacks of 100 pounds, each	.60 =	.28½
Sugar, refined, in loaf or sacks, quintal[1]	.80 =	.38
Sugar, granulated, in sacks, quintal	.70 =	.312
Barrels, empty, 18 gallons, each	.30 =	.142
Barrels, empty, 30 gallons, each	.50 =	.237
Barrels, empty, 60 gallons, each	1.00 =	.475
Casks, empty, 90 gallons, each	1.50 =	.713
Brown sugar, in sacks, quintal	.70 =	.312
Beans, in packages (arroba), 25 pounds	.55 =	.261
Beeswax, in sacks or barrels, quintal	.75 =	.335
Flour in sacks, quintal	.50 =	.237
Shovels, in bundles of ½ dozen	.75 =	.261
Potatoes, in sacks, quintal	.50 =	.237
Lumber, per 1,000 feet	30.00 =	14.25
Burnt rum, barrels, 18 gallons, each	.90 =	.427
Spirits, barrels, 18 gallons, each	.60 =	.285
Boat oars, each	.70 =	.312
Launch oars, each	.90 =	.427
Carts, 2-wheel (unmounted), each	30.00 =	14.25
Carts, 4-wheel (unmounted), each	40.00 =	19.00
Plows, American, each	1.60 =	.76
Merchandise, not described, per ton	12.00 =	5.40
Horses, less than 6, each, $17; over 6	15.00 =	7.125
Cattle, less than 6, each, $15; over 6	12.00 =	5.40
Mules, less than 6, each, $12; over 6	10.00 =	4.75
Sheep, each	2.00 =	.95
Asses, each	7.00 =	3.125
Hogs, each	5.00 =	2.375
Dogs, each	5.00 =	2.375

In addition, 2 sols (95 cents), per ton are payable for embarkation expenses at Panama, and 1 sol (47.5 cents) per box containing 2,000 sols ($950).

Specie, via Panama: Bank of England, London, and Bank of France, Havre or Paris, 1 per cent; Hamburg or Havre, 1¼ per cent; New York, 1¼ per cent; San Francisco, 2 per cent; Central America and Mexico, 2¼ per cent.

Trade and intercourse with the United States, when they break through this barrier, have, besides, to meet the additional charges of

[1] Peruvian quintal = 101.61 pounds.

steamship transportation to San Francisco, or the charges of the Panama Railroad and the steamships from Colon to New York, or the West India liners (one way) to New Orleans.

Not a single steamship navigates these waters under the Stars and Stripes, and so far as is observable, the efforts of the average American merchant and manufacturer are confined to sending circulars and catalogues, when the real issue to get trade is *transportation*.

These exorbitant charges for travel and freights operate effectually as a blockade against American trade and intercourse. They deprive the people of this coast of the advantages that access to the markets of the United States would give them. They increase the cost of their products, restrict their sale to the markets of Europe, and limit the intercourse between the various localities along the coast to the favored classes.

By force of arms, the nations of Europe are parceling out among themselves the continent of Africa, and by skillful combinations in ocean transportation, are controlling the trade, if not the destinies, of our twin continent of South America.

Our Pacific Coast States and their neighbors might, with profit to themselves and to the great relief of these countries, initiate the movement to overcome the obstacles to American intercourse by establishing a line of fast American steamships between San Francisco, Valparaiso, and intermediate points operated on the "live and let live" principle. Connecting with the two railways crossing the Isthmus, the first from Coatzacoalcos to Salina Cruz, and the other from Colon to Panama, these steamships could receive support from the freights and passengers from the United States that would come to the Gulf termini of the two railroads referred to, to be transported to this coast.

The vast importance of this question is obvious, and it can not too soon receive serious consideration.

LEON JASTREMSKI,
Consul.

CALLAO, *March 18, 1895.*

BOLIVIA.

Bolivia's only railroad, the Antofagasta and Bolivia Railway, is owned by an English company, but is rented for a term of years to the Huanchaca Mining Company, who work it; a guarantee of 6 per cent is given jointly by the Huanchaca Company and the Bolivian Government.

The line extends from Antofagasta, Chile, on the Pacific coast, to the mining town of Oruro, with a branch from Uyuni to Pulacayo (Huanchaca mine).

The distance from Antofagasta to the chief points on the line are as follows:

Antofagasta to—	Kilometers.	Miles.
Salinas (nitrate field)	128=	79.54
Calama (town)	238=	147.89
Ascotan (borax lake)	350=	217.49
Ollague (frontier)	435=	270.31
Uyuni (junction)	610=	379.05
Uyuni to—		
Poopo (town)	250=	155.35
Oruro (town)	319=	198.23
Pulacayo (mine)	32=	19.08

The total distance from Antofagasta to Oruro is 933 kilometers (573.55 miles).

The line is in good condition, but short of rolling stock; there are good stations at Antofagasta, Calama, Uyuni, and Oruro, and workshops at Antofagasta and Uyuni. The track is single. The gauge is 75 centimeters (30 inches).

At Oruro, there are two up passenger trains weekly, two freight trains and one composite train, and the same number down; from Uyuni there are two up and two down freight trains daily, and from Salinas, about five. The passenger trains run between Oruro and Antofagasta in three days, running only in daytime. Special trains have come up to Oruro in twenty-three hours.

The freights are calculated from Antofagasta to Ollague (the Chilean frontier) in Chilean currency; present exchange, dollar equals 17 pence (34 cents); and from Ollague to Oruro and Uyuni to Pulacayo in Bolivian currency; present exchange, dollar equals $21\frac{1}{4}$ pence (43 cents).

First-class passenger fare, $4\frac{1}{2}$ cents per kilometer (0.6214 of a mile); general freight upon goods, 1 cent per 100 kilograms (220.46 pounds) per kilometer, plus 25 per cent on Chilean section; general down freight, one-half cent per 100 kilograms per kilometer, plus 25 per cent on Chilean section. Ores shipped in bulk are allowed a reduction of 25 per cent on the above for the whole distance.

In the transport of salt in bulk, a reduction of 30 per cent on the general rate has lately been granted.

The altitudes of the chief points above sea level are:

	Meters.	Feet.
Antofagasta	3.42 =	11.2
Salinas	1,341.70 =	4,410
Calama	2,265.77 =	7,434
Ascotan	3,965.99 =	13,012
Ollague	3,696.24 =	12,126
Uyuni	3,659.80 =	11,996
Poopo	3,711 =	12,192
Oruro	3,698 =	12,129
Pulacayo	4,114.44 =	13,497

Highest point on Uyuni-Pulacayo branch, 4,152.98 meters (13,625 feet).

The only engineering work of any magnitude on the whole line is an iron bridge over the gorge of the Calama River, the rails being at a height of 105 meters (413 feet) above the water.

The up freight is chiefly general merchandise and machinery, and the down freight ores of silver, tin, and antimony, bar silver, and nitrate and borax.

GERARDO ZALLES,
Consul.

LA PAZ, *May 20, 1895.*

INTERIOR TRANSPORTATION.

The Handbook of Bolivia published by the Bureau of the American Republics in 1893, contains the following information as to means of transportation in Bolivia:

The public highways in Bolivia are either national or municipal. The national are built and maintained by the Government from the annual appropriations made therefor by the national Congress. They communicate with the principal cities and mining centers of the Republic. The topography of the country is such as to admit of but few wagon roads east of the high table-lands of western Bolivia.

The most expensive national thoroughfares, both in cost of construction and maintenance, are those built by Indian labor in the upper Andes for the exclusive use of pack animals. Numerous troops of mules, burros, and llamas daily toil up and down these narrow and tortuous trails or wend their way through the deep and narrow passes and around the sharp and precipitous angles of th Cordilleras, bearing their burdens of tropical fruits, coca, cacao, coffee, etc., from Yungas and other warm valleys along the eastern declivities of the Andes to the markets of La Paz and other cities in exchange for flour, dry goods, alcohol, etc. The vast interior commerce of Bolivia, as thus carried on, is a genuine surprise to every foreigner visiting the country, and especially as it is conducted almost entirely by Indians.

The construction and maintenance of the municipal roads is under the control of the several municipalities. These roads, as a rule, connect the principal cities with the adjacent towns and settlements, and for the most part are well built. One of the best in the country is the Arce avenue, connecting the city of La Paz with Obrajes, a small village 3 miles distant. This road, which is the principal driving course of the city, was completed this year at a cost of about 75,000 bolivianos ($34,625). Perhaps the finest municipal highway in the country is that connecting Cochabamba with the baths of Calacala. Those of Sucre, the capital of the Republic, are also well built, and are among the best carriage roads of Bolivia. The best long-distance roads are those connecting the city of La Paz with Chililaya (Puerto Perez), the Bolivian port on Lake Titicaca, 45 miles distant, and with Oruro, a distance of 150 miles. The municipal roads of La Paz and other cities are maintained in much

the same way as are the country roads in Ohio and other parts of the United States, all male citizens between certain ages being obliged to work on the public highways one day in each six months or pay in lieu thereof 50 cents (24 cents in United States money), the sum allowed the Indians therefor per day, who, with but rare exceptions, do this class of work.

Regular stage lines are maintained as follows:

	Miles.
La Paz to Chililaya, to connect with the lake steamers	45
La Paz to Oruro	150
Oruro to Cochabamba	123
Oruro to Laguinillas	135
Cochabamba to Sucre	195
Potosi to Sucre	77
Total stage service	725

In addition to this, there is now under construction a stage road from Tarija to Tupiza.

RAILROAD CONNECTIONS.

In his report on the railways of Bolivia to the International American Conference, then in session at Washington (February, 1890), the Bolivian delegate, Señor Juan Francisco Velarde, says:

> The central location of Bolivia has retarded the development of its railroads, since it has been obliged to wait until the lines of the neighboring countries should approach its own frontiers before undertaking their extension, as in the case of those from Mollendo to Puno, and from Arica to Tacna, in Peru, which still remain idle within their respective limits, and that of the Central North Argentine Railway, which is now nearing Jujuy, with every probability that it will be extended as far as the Bolivian frontier.

Bolivia has three lines of communication with the Pacific Ocean: (1) by the Antofagasta and Oruro Railway;[1] (2) by the Mollendo and Puno Railway, in connection with the Lake Titicaca and Desaguadero River steamers; (3) by the Arica Railway.

Arica Railway.—The Arica Railway runs from the Chilean port of Arica to Tacna, a distance of 47 miles. From here the road is to be extended via Corocoro to La Paz. This proposed extension covers a total distance of 294 miles. At present traffic is carried on between La Paz and Arica by means of mules and llamas. Owing to the short distance to the coast by this route the commerce of La Paz, Oruro, and Cochabamba has hitherto largely passed this way. The prolongation of this line to La Paz will be attended by unusual engineering difficulties and enormous cost in ascending the steep acclivities of the Western Cordillera, over which it must pass.

Mollendo and Puno Railway.—This is a standard-gauge road running from the Peruvian port of Mollendo, via Arequipa, to Puno, on Lake Titicaca, a distance of 325 miles. From here communication is had with Bolivia by the Lake Titicaca steamers crossing to Chililaya, a

[1] Already described in consular report from La Paz.

distance of 110 miles, and thence to La Paz, 45 miles, across a practically level plain, with the exception of the winding descent into the city, which covers a distance of 3 miles over one of the best constructed gravel roads met with in any country.

The Mollendo and Puno Railway was opened to traffic in 1870, in connection with the steamers on Lake Titicaca and the Desaguadero River, which are owned and operated by the same company. The Peruvian bondholders, who now own the road, recently secured a concession from the Bolivian Government for the construction of a railway from Desaguadero, the southern terminus of lake navigation, to La Paz, a distance of 66 miles. The object of this proposed road is to hold the La Paz traffic against the competing line of the Antofagasta Railway Company, about to be extended to that city from Oruro.

In addition to these several routes to the Pacific Ocean, the configuration and vast area of eastern and southern Bolivia give rise to two additional channels of communication; north by way of the Amazon and south by way of the La Plata to the Atlantic seaboard.

PROJECTED RAILROADS.

Recognizing the importance of placing the eastern part of the Republic, which, like the western part, has its own distinctive resources and trade, in direct communication with the Atlantic Ocean, the Bolivian Government has recently granted liberal concessions for the construction of railways from the interior of the country to the navigable tributaries of the Amazon and La Plata.

These concessions embrace the following new lines of road: (1) A railway from Oruro to Cochabamba, and thence to Trinidad, on the Mamore, which has its outlet to the Atlantic through the rivers Madeira and Amazon. (2) A railway from La Paz through the rich province of Yungas to the head of navigation on the Beni River, which unites with the Mamore at the Bolivian port of Bella Vista to form the Madeira. (3) A railway from Cochabamba to Santa Cruz de la Sierra, the capital of the rich and extensive Department of Santa Cruz, and thence to Puerto Pacheco, on the Paraguay River. (4) The extension of the Paraguay and Bolivian standard-gauge railway now under construction from Asuncion, on the Paraguay River, to the frontier of Bolivia, and thence to be built through Bolivian territory to Sucre, the capital of the Republic. This road, of which Gen. Thomas O. Osborne, of Chicago, is the president, follows up the famous valley of the Pilcomayo through what is known as the Gran Chaco, which possesses a dry and fertile soil and a mild and healthful climate, while the Bolivian extension is bounded on either side by some of the richest mining districts of the Republic. From Sucre it is proposed to continue this road via Oruro, La Paz, and the eastern shore of Lake Titicaca to Santa Rosa, in Peru, where it is to unite with the railway system of southern Peru now being extended from that point to Cuzco. If this road is built, it

will not only be the most important railway in Bolivia, but will furnish, in connection with the line now under construction from Buenos Ayres to Asuncion, continuous railway connection between Cuzco, the ancient capital of the Incas, and Buenos Ayres, the capital of the Argentine Republic, over a track of uniform gauge and covering a total distance of about 2,000 miles. It will also be connected with the sea by the Paraguay and La Plata rivers, whose waters are navigable for ocean steamers as far as Asuncion, the terminus of the road, and for river steamers several hundred miles farther up. (5) A railway from Uyuni, on the Antofagasta line, to La Quiaca, on the Argentine frontier, to meet the proposed extension of the North Central Argentine from Jujuy. A branch is also contemplated from Uyuni to Potosi. As this road, if built, will furnish to Bolivian traffic an important and much-needed outlet to the Atlantic seaboard, its promoters have secured perhaps the most liberal railway concession ever granted by the Bolivian Government.

TELEGRAPHS.

Bolivia has telegraphic communication with Peru, Chile, and the Argentine Republic, and thence by cable with the United States and Europe. The following lines are now in operation: La Paz to Tacna; La Paz to Desaguadero, on the Peruvian frontier; La Paz to Oruro (opened July 16, 1892); Oruro to Uyuni; Sucre to Potosi; Potosi to Huanchaca; Potosi to Cotagaita; Potosi to Colquechaca; Cotagaita to Tupiza; Cotagaita to Camargo; Tupiza to La Quiaca, on the Argentine frontier; Tupiza to Tarija; Huanchaca to the Chilean frontier. Total length of lines, 1,500 miles.

TRADE ROUTES.

Nature has denied to Bolivia the usual facilities for trade enjoyed by most countries. Her foreign and internal traffic must traverse long distances, precipitous mountains, and inhospitable plains. Her principal trade routes are through Chilean and Peruvian territory to the Pacific seaboard, although considerable traffic passes to the Atlantic Ocean, via the Argentine Republic and over the Amazon River and its tributaries through Brazil. The Pacific coast trade is carried on through the Peruvian port of Mollendo and the Chilean ports of Arica and Antofagasta.

The Arica route.—The shortest course is that via Arica, which involves a land transit of 240 miles from La Paz across the Cordillera of Tacora to Tacna, and thence by railway to Arica, 40 miles distant. Pack mules usually occupy about seven days, donkeys nine days, and llamas fifteen days in making this journey to and from La Paz. The trade of the Departments of Oruro, Cochabamba, and, in part, that of La Paz, is carried on through this port. But for official returns, the enormous traffic claimed for this precipitous mountain route would seem incredible. In the annual report for 1890 of the director-general

of statistics of the number of cargoes of merchandise and sundry articles imported to Bolivia during 1889 through the custom-house at Arica, and either from thence or from Tacna transported by mules, donkeys, and llamas across the Cordilleras to the provinces of Oruro, Potosi, La Paz, Cochabamba, and Sucre, the following totals are given:

Cargoes transported:	Number.
By mules	11,935
By donkeys	24,522
By llamas	25,999
Total	62,456

Having a total weight of 394,040 arrobas, or 9,851,000 pounds.

As the average cargo for a mule is 225 pounds, for a donkey 150, and for a llama 100 pounds, the amount of freight thus carried over the Cordilleras to the interior of Bolivia from this one port would furnish cargoes for 43,782 mules, or 65,673 donkeys, or 98,510 llamas, or an average of 69,321 pack animals. While there are no statistics showing the amount of freight exported during 1889, it is fair to conclude that, as the annual exports of Bolivia are more than twice its imports, at least as much cargo was transported by this route to the coast as from it during this period, thereby making the total for the year not less than 19,702,000 pounds, and requiring a corresponding increase in the number of pack animals to transport it.

The recent extension of the Antofagasta Railway from Uyuni to Oruro is likely to divert much of this traffic to the all-rail route to Antofagasta. This, however, will be more than recovered to the Arica and Tacna Railway upon the extension of its line to Oruro and La Paz, as is now proposed. This route and that of Arica, together with their extensions to Potosi, traverse one of the richest mineral districts of the globe.

Mollendo route.—The principal part of the trade from La Paz and the lake provinces, including that of the rich copper districts of Corocoro, is by steamers up the Desaguadero River and across Lake Titicaca to Puno, and thence by the Mollendo, Arequipa and Puno Railway across Peru to Mollendo. The distance from La Paz is 479 miles, viz, land transit from La Paz to Lake Titicaca, 45 miles; lake transit, 110 miles; railway transit to the coast, 324 miles.

The Bolivian traffic by this route is something enormous, and is steadily increasing. It is not uncommon to see from 1,000 to 1,500 mules receiving and discharging cargo at Chililaya, the Bolivian port of Lake Titicaca, for La Paz and other interior towns.

Antofagasta route.—This is also a continuous railway route, extending from Oruro, 150 miles south of La Paz, to the Pacific coast at Antofagasta, distant from Oruro 573 miles and from La Paz 723 miles. The recent extension of this narrow-gauge line from Uyuni to Oruro, a distance of 312 miles, which was opened to traffic April 29, 1892, makes it a competing line for the Pacific coast trade with that of the Mollendo

and Puno standard gauge and the lake and river steamers owned and operated in connection therewith.

The great bulk of the commerce of the Departments of Chuquisaca, Potosi, and of the southern part of Oruro, is transported by this Antofagasta line, notwithstanding the Argentine North Central Railway is rapidly approaching the southern frontier of Bolivia, being now opened to traffic as far north as Jujuy.

Argentine route.—A fourth and longer outlet is that through Argentine territory to the Atlantic. The commerce of the province of Tarija and, to some extent, that of Potosi and Chuquisaca, passes this way. This route involves a land transit of about 770 miles from Pupiza and Tarija, the location of the south Bolivian custom-houses, to Jujuy, the terminus of the North Central Railway, and thence 836 miles by rail to Rosario, on the Parana River, and thence 246 miles by steamer to the Atlantic.

The great distances to be traversed by this route are shown by the following table:

	Miles.
Buenos Ayres to Rosario by steamer	240
Rosario to Jujuy by rail	836
Jujuy to—	
Tarija and Tupiza by cart road	267
Potosi by cart road	420
Sucre by cart road	507
Cochabamba by cart road	717
Uyuni (Antofagasta Railroad station) by cart road	300
La Paz by rail and cart road	762

The amount of tin, silver, bismuth, and other products passing this way for the month of January, 1889, according to the custom-house valuations, was 123,951.55 bolivianos ($58,860), of which 112,405.25 bolivianos ($53,874) were exports and 10,946.30 bolivianos ($4,986) were imports. Assuming that this was an average month, the annual traffic by this course is, in round numbers, about 1,500,000 bolivianos ($712,500).

Paraguay River route.—This route extends from Puerto Suarez and Puerto Pacheco, farther south on the Paraguay River, and about 475 miles eastward from Santa Cruz de la Sierra down the Paraguay and La Plata to the Atlantic Ocean. These are comparatively new ports, established to meet the demands of the growing trade of eastern and southeastern Bolivia with the Atlantic seaboard.

As there are no published reports of the commerce of these ports, it can not here be even approximately given. If the projected railway from Santa Cruz de la Sierra to Puerto Pacheco, and that of Gen. Thomas O. Osborne, of Chicago, from Asuncion to Sucre, are built, the Paraguay River is destined to become one of the most important and profitable trade routes of the Republic.

Amazon River route.—This outlet extends from Villa Bella, the Bolivian port at the confluence of the Mamore with the Madeira River, thence via the Madeira (or Madera) and Amazon rivers through

Brazil to the Atlantic Ocean. In addition to about 35,000 quintals (3,549,700 pounds) of rubber annually exported from northern Bolivia via the Purus and Amazon, large quantities of this valuable product are brought down the Madre de Dios, Beni, and Itenez (Guapore) rivers to Villa Bella, and thence shipped to Europe.

CHILE.

RAILWAYS.

State lines.—The present terminus of the State Great Trunk Line, which starts from Valparaiso, is Temuco, the length being 564 miles, but the future terminus will be Puerto Montt. The Great Trunk Line is comprised of three divisions, viz, Valparaiso to Santiago, including Andes branch; Santiago to Talca, including Melipilla line and several branches; and Talca to Talcahuano and Traiguen and branches. The distances are:

	Miles.
First division:	
Valparaiso to Santiago	114
Llaillai to Los Andes	31
Second division:	
Santiago to Talca	162
Melipilla	38
Palmilla	40
Third division:	
Talca to San Rosendo	155
San Rosendo (junction) to Talcahuano	53
San Rosendo to Robleria (junction)	34
Robleria to Traiguen	66
Robleria to Victoria	60

Victoria to Temuco, in course of construction. A branch of 26 miles is also being built from Coigue to Mulchen. The prolongation of the Great Trunk Line from Temuco to Osorno, 204 miles, has also been commenced, in two or three places, in the Provinces of Valdivia and Llanquihue.

The surveys and estimates for the prolongation of the Palmilla branch from Alcones to Pichilemu, 34 miles, have been completed. Surveys are being made of the Quilpue to Casa Blanca section, 25 miles (Melipilla and Santiago line).

The Vilos, Illapel, and Salamanca line, 80 miles, is in course of construction.

The branch from Calera to Ligua and Cabildo, 46 miles, is in course of construction, and is partially opened to traffic.

The line from Talca to Constitucion, 53 miles, is in course of construction, and is partially opened. The Parral to Cauquenes branch, 31 miles, is in course of construction.

The State also owns the Chanaral line, 40 miles, and the Huasco and Ballenar line, 30 miles. The tendency of public feeling is that the State should take over all the private lines. Negotiations are actually in progress for the purchase of the Coquimbo Company's lines and the partially commenced Transandine line.

Private lines.—The private lines, commencing from the north, are:

	Miles.
Arica to Tacna	39
Iquique to Pisagua and branches	250
Mijillones to Cerro Gordo	18
Antofagasta to Bolivia boundary line	350
Taltal	51
Copiapo and branches	151
Carrizal and branches	50
Coquimbo to Serena, Ovalle, and Panulcillo	86
Serena to Vicuna	49
Tongoi to Tamaya	34
Penco to Concepcion	9
Arauco Company's lines (Concepcion to Curtilanhuc)	59
Total	1,146

All of these lines, with a trifling exception, are single track and generally in good condition.

There is no fixed rate for freight or passengers of so much per mile as in some countries, but traveling on the State lines at the present value of the legal-tender currency ranks among the cheapest in the world. As an example, the fare from Valparaiso to Santiago, first class, 114 miles, is $1.56, United States gold.

The facilities for traveling by road and rail will compare favorably with those of many older and more populous countries.

The Copiapo line was opened in 1851 and was the first in the Southern Hemisphere.

The first section of the Great Trunk Line, Valparaiso to Vina del Mar, was opened in 1854; and the inauguration of the first division, from Valparaiso to Santiago, was in 1863.

Owing to the mountainous character of the country, many of the roads and railways afford numerous examples of excellent engineering ability.

One perceives at once upon examining the map of Chile that the national system of railways when completed will be a great central trunk line, running from north to south, with subsidiary lines branching off to the various seaports.

HIGHWAYS.

The main highways of the country are kept in very good order, and, as a rule, admit of the passing of two vehicles. Communication varies according to district requirements.

OCEAN LINES.

As Valparaiso is an important seaport, there are various steamship lines running therefrom to Europe and the United States, the following being the most important: The Pacific Steam Navigation Company and the Gulf Line Company run each a line of steamers to Europe, via the Straits of Magellan. Two German companies, a French company, and Lamport & Holt also run lines to Europe. The Merchants' Line (W. R. Grace & Co.) run between Valparaiso and New York.

All of these lines obtain a share of the coasting trade, but that is chiefly monopolized by the Pacific Steam Navigation Company and the South American Steamship Company's lines, which latter is under the Chilean flag. These two lines each run a steamer every two weeks alternately to and from Panama, carrying the United States mail.

The steamers of the several lines are as follows:

SOUTH AMERICAN STEAMSHIP COMPANY.

Name.	Net tonnage.	Horse-power.	Name.	Net tonnage.	Horse-power.
Aconcagua	3,000	3,100	Limari	900	650
Imperial	3,000	3,000	Lumaco	700	450
Mapocho	3,000	2,000	Malleco	700	450
Maipo	2,950	2,000	Chillan	650	450
Cachapoal	2,755	1,900	Biobio	600	450
Lautaro	2,600	1,600	Lircai	600	400
Amazonas	2,500	1,800	Cautin	600	400
Itata	2,600	1,500	Maule	250	240
Copiapo	1,800	900	Pudeto	200	230

PACIFIC STEAM NAVIGATION COMPANY.

Name.	Net tonnage.	Name.	Net tonnage.
Coastwise:		Coastwise—Continued:	
Santiago	3,190	Bolivia	1,925
Arequipa	3,190	To Europe, via the Straits of Magellan:	
Patagonia	2,868	Sorata	6,050
Puno	2,390	Orellana	5,000
Pizarro	2,160	Galicia	3,829
Quito	1,750	Liguria	4,688
Serena	2,394	Potosi	4,260
Mendoza	2,169	Orcana	5,000
Ecuador	1,768	Britannia	4,132
Ayacucho	1,925	Iberia	4,702
Coquimbo	1,821	Cargo steamers:	
Arica	1,771	Inca	4,000
Manabi	1,041	Magellan	4,000
Arauco	801	Antisana	4,000
Chala	598	Araucania	2,877
Casma	592	Sarmiento	4,000
Osorno	532		

THE GULF LINE.

Name.	Net tonnage.	Name.	Net tonnage.
Gulf of Suez	1,535	Gulf of Martaban	2,447
Gulf of Akaba	1,975	Gulf of Lions	2,662
Gulf of Papua	1,971	Gulf of Ancud	2,716
Gulf of Venice	2,923	Gulf of Florida	2,865
Gulf of Mexico	3,082	Gulf of Genoa	3,448
Gulf of Trinidad	2,361	Gulf of Bothnia	3,452
Gulf of Corcovado	2,361	Gulf of Siam	3,432
Gulf of Guinea	2,438	Gulf of Taranto	3,432

MERCHANTS' LINE (W. R. GRACE & CO.).

Name.	Tonnage.		Horse-power.
	Gross.	Net.	
Condor	3,053.12	1,957.88	1,400
Cacique	3,052.10	1,951.11	1,400
Capac	3,052	1,951	1,400

JAMES M. DOBBS,
Consul.

VALPARAISO, *November 22, 1894.*

PARAGUAY.

RIVERS, BOUNDARIES, AND HILLS.

Paraguay proper is limited by natural boundaries. It lies entirely to the eastward of the Paraguay River. The vast territory west of this river which was conceded to Paraguay, in 1877, under the arbitration of President Hayes, is not yet opened to traffic, and is inadequately explored. It is known by the names Paraguay and El Gran Chaco, and except along the western shore of the Paraguay River, it is uninhabited by white men and without the range of commerce.

Paraguay proper has been settled for centuries, and it is to it that my report of traffic must necessarily be confined.

The Rio Apa is the northern boundry of Paraguay proper, separating it from the Brazilian Province of Matto Grosso. It runs almost due east and west, having a slight inclination to west by south. Its intersection with the Paraguay River (at latitude 22° 5″ south, longitude 60° 10″ west), makes the northwest limit of Paraguay. South of the Rio Apa, following its course irregularly, at about half a degreedistant from it, is a line of hills (the Sierra de las Puntas) forming the watershed of the Rio Apa, from the south, and the Rio Aquidaban, from the north. The Rio Apa takes its rise in a range of hills (the Sierra Ubaracayu) and that point (latitude 22° south, longitude 57° 40″ west from Paris) forms the extreme northeastern boundary of the Republic.

This range of hills continues nearly due south for about 60 miles, separating Paraguay from the Brazilian Province of Matto Grosso, and helping to form the eastern boundary of Paraguay proper, when the hills take an eastward turn and are crossed by the Parana River.

The Parana River at this point becomes very much narrowed, being forced through a gorge and forming the famous cataract of La Guayra. From this cataract southward, Paraguay proper has a river boundary.

The Parana River, continuing in its southern course, furnishes the remainder of the eastern boundary of Paraguay; it then sweeps in a long curve toward the west, marking the southern boundary between Paraguay and the Argentine Republic. Just above the Argentine town

of Corrientes, the Parana joins the Paraguay River and forms the southwest limit of Paraguay (latitude 27° 15″ south, longitude 60° 58″ west).

The Paraguay River ends at the point of confluence with the Parana. At this point there is a town called Paso de la Patria, the extreme southwestern town of Paraguay, while the town of Apa, at the confluence of the Rio Apa and the Rio Paraguay, is the extreme northwestern town. Between Apa and Paso de la Patria, runs the Paraguay River, forming the entire western boundary of Paraguay proper.

Besides the range of hills mentioned as forming the boundaries of Paraguay, there is another range with numerous offshoots, hillocks, and buttes, passing irregularly down the center of the Republic from north to south. The waters from the eastern slopes run into the tributaries of the Parana River, while their western slopes furnish water to the streams running into the Paraguay.

It is necessary to understand this arrangement of hill and watershed in order that, in treating the subject of river navigation, its possibilities may be made manifest. None of the hills are more than 1,500 feet in height, yet they cause Paraguay to be the best watered land in South America, keeping the country perpetually green and prolific.

HIGHWAYS.

Those who established settlements here made four principal highways. Starting from Asuncion, these may be described as follows:

First. The southern road, keeping near the bank of the Paraguay River and touching the towns of Lambare, Ypane, Villeta, Cliva, Villa Franca, Villa del Pilar, Humaita, and Paso de la Patria, where the Paraguay River loses itself in the Parana.

Second. The road through the missions established by the Jesuits, the best populated thoroughfare of the Republic, passes through the towns of San Lorenzo, Capita, Ita Carepegua Quindy, Caapucu, Villa Florida, Santa Rosa, and Carmen to Encarnacion.

Third. The east road, through Luque, Aregua, Itagua, Pirayu, Paraguari, Ibilimi, and Villa Rica. This is the road which the railway follows.

Fourth. The north road, passing through Trinidad, Limpio, Embosado, and Arroyos y Esteros, where it separates, one branch keeping along the shore of the Paraguay River, through Itacurubi, Rosario, San Pedro, Concepcion, San Salvador, and Apa; and the other, turning toward the east at Arroyos y Esteros, and taking in the towns of Catigua, San Estanislao, and Villa Ygatimi.

There is no legal standard of width prescribed for these roads. They are very rarely fenced, and frequently wind to avoid obstacles, such as hills, swamps, woods, etc. Landowners seldom complain of roads that wind through their unimproved property. In such cases, the privilege of the landowner yields to the necessities of the people.

These four principal roads are connected by cross roads at all principal points, but none of them are macadamized, or have any pretension to paving. They are traversed by ox teams carrying freight, and by ponies carrying passengers. After a heavy rain, they are impassable at certain points, where gullies or washouts may be formed, but the loose soil of Paraguay favors rapid drying of the roads, and they seldom remain impassable for more than a few days. In fact, nature has furnished Paraguay with a remarkable compensation for muddy roads, for just in proportion as the roads become impassable, the rivers and creeks become navigable, and rafts and scows alternate with bullocks and ponies in performing the functions of transportation. The roads described are all free, no toll being collected for their use.

There are no canals, and, with the exception of here and there a short one to get around some rapids, there will be no necessity for building any.

There are a few stagecoaches and diligences on some of these roads, but they lead a precarious existence.

Ponies are so cheap ($12 will purchase a good one) and the scenery so beautiful that travelers do not care to be cooped up in diligences.

Away from the lines of the rivers and railroad, mails are distributed by pony riders having appointed circuits, and the service is generally accounted good.

RAILWAYS.

There is but one railway in the country. It is owned by a private corporation and runs from Asuncion to Pirapo, a distance of 250 kilometers (155.4 miles). Pirapo, its present terminus, should hardly be dignified by the name of a town. The ultimate terminus of the road is to be the city of Encarnacion, on the Parana River, where communication may be made with the Argentine town of Posadas, opposite Encarnacion, to connect with the Argentine system of railways at that point. The prolongation of the road from Pirapo to Encarnacion is involved in disputes which it would be out of place to discuss in an article like the present one. It is to be hoped that they will find a speedy solution under the new Government that has just been elected, so that the road may have the benefit of a well-populated town, on the margin of a navigable river, for its terminus, instead of a few sheds on the edge of a swamp, as at present.

I am indebted to Mr. White, the present manager, for the following data concerning the road, and I think no one can deny that its services are more cheaply supplied than even most roads in the United States.

The road is broad gauge, single track, 250 kilometers (155.4 miles) in length. Principal points: Asuncion to Paraguari, 72 kilometers (44.8 miles); Paraguari to Villa Rica, 28 kilometers (17.4 miles); Villa Rica to Pirapo, 150 kilometers (93.2 miles).

Trains run between Asuncion and Villa Rica daily; between Asuncion and Pirapo every other day. First-class passage is $15, Paraguayan paper, for the 250 kilometers (155.4 miles), which at the present

rate of exchange of 600 per cent gold premium, would be about 1 cent per kilometer (1.6 cents per mile).

The freight rates per ton (gold) for the entire distance, 155.4 miles, are as follows: $10.30, $2, and $1.50, for first, second, and third class, respectively.

Trains run at about 14 miles per hour, including stoppages. They are not exclusively passenger trains, carrying freight also. Recently I made the trip as far as Villa Rica, and would pronounce the condition of the line good. The remarkable freedom from accidents that this road has enjoyed would corroborate this assertion, although I can not speak as a railway expert.

TRAM LINES.

Besides the railway, Asuncion is supplied with two tram lines that are now under one management. One of these lines is extended from the suburbs of the city to San Lorenzo, a town about 10 miles distant on the Mission road already described.

The trams leaving the city suburbs are hauled by steam locomotives to San Lorenzo. They go every few hours, and as the road has been surveyed beyond San Lorenzo with the intention of extending it, I think it worth while to mention this steam tram line, as it may be the nucleus of what is destined to become an important railway in Paraguay.

RIVER NAVIGATION.

There are three lines of steamers running to Paraguay, all having their starting point at Montevideo.

Platense Line.—This is a British line. The steamers run once a week; their average tonnage is 914. Freight charges from Montevideo to Asuncion (1,100 miles), $5 (gold) per ton; first-class passage, $40, and second-class passage, $20. The trip takes a week, counting all stoppages. The vessels are finely equipped with electric lights and modern appliances. This line has an auxiliary at Corrientes, running once a week to Posados, on the upper Parana, opposite the Paraguayan city of Encarnacion, to which it is connected by ferry, and another weekly service auxiliary from Asuncion to Concepcion, on the Paraguay River. Both these auxiliaries charge about $10 and $5 (gold) for the trip, first and second class, respectively. As the passage money is paid in paper, it is difficult to calculate in such a fluctuating medium. These figures may be taken as a fair average, however.

Trasportes Fluviales.—This is an Argentine line, and has the same itinerary as the *Platense*; no regular auxiliary steamers; average tonnage, 800 tons; rates of freight and passage, 10 per cent less than the rate of the *Platense* Line; steamers run about once a week to Asuncion.

Lloyds Brazileiro.—This is a Brazilian line, and is heavily subsidized by the Brazilian Government; average tonnage, 600. These vessels

have to be lighter than those of the two lines previously mentioned, as they run to the Brazilian Province of Matto Grosso, as far as Corumba, 600 miles above Asuncion, where an auxiliary line of small steamers extends navigation some 500 miles farther north, to the town of Cuyaba. The rates of passage and freight are the same as by the Platense Line.

The rates quoted refer to the trips made against the stream; a discount of about 10 per cent may be calculated for the down river trips.

The tributaries of the Paraguay River are rarely navigated by steamers; sometimes a light-draft steamer ascends the Tebicuary as far as Villa Florida. There is, also, a small steamer on the Jejuy River, but it runs irregularly, most of the navigation being by rafts and scows (chatas.)

OPPORTUNITIES FOR AMERICAN ENTERPRISE.

I can not leave this subject without referring to two means of transportation in which the United States excel and which are unknown in this part of the world.

The first is rapid running, light-draft, river steamboats, with broad decks, on and from which freight can be rapidly shipped and discharged. All the steamers before referred to have the cut of ocean steamers and are built of iron. It is said that this is necessary to enable them to make the passage between Montevideo and Buenos Ayres, which is sometimes quite rough; but whatever is gained at Montevideo must be lost at the upper end of the trip, for, besides being much more expensive in construction and vastly inferior in beauty to our river steamers, a year seldom goes by that they have not, during several months, to anchor 30 miles below Asuncion and unload passengers and freight to vessels of lighter draft. Their plan of construction prohibits navigation of the smaller rivers and creeks, so that a considerable interior territory remains excluded from the benefits of cheap transportation and the development of the resources of the country to that extent retarded.

The second is the electric trolley system, so cheap in its construction as compared with the steam railroad and its bulky locomotives, heavy ballasted roadbed, and enormous consumption of fuel. Increased encouragement to trade between the United States and Paraguay would bring these two means of transportation within reach of this country, to the mutual advantage of both, while transportation must still continue to drag along in the old channels, dominated by backward European methods, so long as Paraguayan products find almost their only market in the Argentine Republic or in Europe.

EBEN M. FLAGG,
Vice-Consul.

ASUNCION, *September 20, 1894.*

URUGUAY.

OCEAN LINES.

The following are the principal ocean lines whose steamers touch at this port: Royal Mail Steamship Company, Pacific Mail Steam Navigation Company, Messageries Maritimes, Chargeurs Réunis, Norddeutscher Lloyd, Navigazione Generale Italiana, La Veloce, Hamburg Südamericanische Dampfschifffahrts-Actien-Gesellschaft, Kosmos, Hansa, Compañía Trasatlántica Española, Lamport & Holt Line, and Lloyds Brazileiro.

All the lines enumerated are owned by corporations—English, German, French, Spanish, Brazilian, and Italian.

Royal Mail Steamship Company.—English; not subsidized; termini, Southampton and Buenos Ayres; main points touched, Vigo, Lisbon, St. Vincent, Pernambuco, Bahia, Rio de Janeiro, Montevideo; fortnightly service; condition of the line, good; number of vessels and their capacity not obtainable, on account of changes in progress.

Pacific Steam Navigation Company.—English; termini, Liverpool and Pacific coast; main points touched, Lisbon, Pernambuco, Bahia, Rio de Janeiro, Montevideo, Punta Arenas, and Valparaiso; fortnightly service; condition of line, good.

Messageries Maritimes.—French; subsidized; termini, Bordeaux and Buenos Ayres; main points touched, Lisbon, Rio de Janeiro, Montevideo; monthly service; condition of line, good.

Chargeurs Réunis.—French corporation; subsidized; termini, Havre and Buenos Ayres; main points touched, Lisbon, Pernambuco, Bahia, Rio de Janeiro, Santos, and Montevideo; weekly service; condition of line, good.

Norddeutscher Lloyds.—German corporation; subsidized; termini, Bremen and Buenos Ayres; main points touched, Antwerp, Lisbon, Bahia, Rio de Janeiro, and Montevideo; condition of line, good.

Navigazione Generale Italiana.—Italian corporation; termini, Genoa and Buenos Ayres; main points touched, Marseilles, Barcelona, Rio de Janeiro, Santos, and Montevideo; condition of line, good.

La Veloce.—Italian corporation; termini, Genoa and Buenos Ayres; main points touched, Barcelona and Montevideo; condition of line, good.

Hamburg-Südamericanische Dampfschifffahrts-Actien-Gesellschaft.—German corporation; termini, Hamburg and Buenos Ayres; main points touched, Montevideo; condition of line, good.

Kosmos line.—German corporation; termini, Hamburg and Pacific coast; main points touched, Montevideo and Punta Arenas; condition of line, fair.

Hansa.—German corporation; termini, Bremen, Hamburg, and Buenos Ayres; main points touched, Brazilian ports and Montevideo; freight line; no passenger accomodations.

Campañía Trasatlántica Española.—Spanish corporation; subsidized; termini, Barcelona and Buenos Ayres; main points touched, Cadiz and Montevideo.

Lloyds Brazileiro.—Brazilian corporation; subsidized; termini, Rio de Janeiro and Montevideo; main points touched, Santos, Desterro (Porto Alegre), Rio Grande, and Pelotas. This corporation has also a service between Montevideo and the Brazilian State of Matto Grosso, touching at Buenos Ayres, Rosario, Asuncion, Corumba, and Cuyuba. The condition of this line leaves a great deal to be desired as to passenger accommodations.

Lamport & Holt Line.—This corporation has now a direct steamer line between New York and the River Plate, principally a freight line; passenger accommodations rather poor.

Freight rates vary between Europe and the River Plate, from $10 to $25 per ton; between River Plate and Rio de Janeiro, at present, $5; River Plate and Bahia, $7; and Pernambuco, $9, per ton of 2,204.6 pounds.

RIVER NAVIGATION.

There is very good service between Montevideo and Buenos Ayres, and also to points farther up the rivers, supplied by the following corporations and private enterprises:

(1) *La Platense Company, Limited* (in liquidation).—Montevideo to Buenos Ayres, and also to Asuncion and Corrientes; steamers, *Venus*, *Eolo*, *San Martin*, *Olimpo*, *Minerva*, *Posodas*, and *Lucero.*

(2) *Mensajerías Fluviales de la Plata.*—Steamers: *Helios*, *Montevideo*, *Labrador*; between Montevideo, Buenos Ayres, Paysandu, and Salto.

(3) *Compañía Argentina de Navegacion á Vapor*, "*Animo et fide.*"—Steamers *Rivadavia* and *Comercio.*

(4) *Golondrina I.*—Captain Piaggio, owner; passenger rates between Montevideo and Buenos Ayres, first class, $4 to $6; steerage, $1 (one night's trip, with food); freight, $2 per ton; rates to the other river points variable.

RAILWAYS.

There are at present six railways in regular working order in Uruguay, with 1,567 kilometers (973.7 miles) under construction, and 1,231 kilometers (764.9 miles) more under survey.

Ferrocarril Central del Uruguay.—This, an English corporation, limited, is the principal railroad in Uruguay. The line runs from Montevideo through the whole of the territory of the Republic to the capital of the Department of Rivera, situated on the Brazilian line, opposite the Brazilian town of Santa Ana do Livramento, 375 kilometers (233 miles), besides a branch line to San Jose, 32 kilometers (19.88 miles).

Nordeste del Uruguay.—This line runs from Montevideo to Minas, 122 kilometers (75.8 miles), and is controlled by the Ferrocarril Central.

Extension Este.—This road runs from the station Toledo, on the Nordeste line, to Nico Perez, 206 kilometers (128 miles), and is also controlled by the Ferrocarril Central.

Noroeste del Uruguay.—This line runs from Salto, through the Departments of Salto and Artigas, to Cuareim (Paso del Correo), where connection is made with the Brazilian line at Uruguayana, 178 kilometers (111 miles).

Midland Uruguay.—Connecting the Central with the Noroeste, from Paso de los Toros to Salto, touching the City of Paysandu, 317 kilometers (111 miles).

Norte del Uruguay.—This road runs from the station Isla Cabellos, on the Noroeste road, through the department of Artigas, to San Eugenio, its capital, situated on the Cuareim River, opposite the Brazilian town of San Juan Bautista, 114 kilometers (70.8 miles).

Del Norte.—The Del Norte runs from Montevideo to the bar of the Santa Lucia River, where the city slaughterhouses are located, 23 kilometers (14.29 miles). This line has the monopoly for bringing the meat to Montevideo for city consumption.

The railways of Uruguay are all single-track lines. They are owned by English corporations, who spend as little as possible on them, and try to make as much as possible out of them. Passenger rates, as well as freight rates, are excessively high, and, consequently, the development of the resources of the country, instead of being furthered by railways, is rather impeded by them.

HIGHWAYS.

The roads in Uruguay are in a very bad condition. Wagons are not used for hauling, however, all this being done in antiquated high-wheeled carts. There are no public roads in Uruguay worthy to be called highways.

EDGAR SCHRAMM,
Consul.

MONTEVIDEO, *December 10, 1894.*

ARGENTINE REPUBLIC.

OCEAN LINES.

In the first category mentioned in the circular, I am at a loss to know if the great intercontinental lines of steamships plying between foreign ports and the Argentine Republic are intended to be included. If so, I can only say that all these "ocean lines" are owned abroad, and that detailed information in regard to them can only be obtained from the home offices in other countries. Only agencies of these various lines

are located here, and the representatives can not or will not give any data concerning either passenger or freight traffic from the home ports in this direction. Still, it may be of some interest to name the more important of these "ocean lines," to the extent at least of "supplying American merchants, travelers, and students" with the information necessary to enable them, from any given port, to reach the River Plate.

Royal Steam Packet Company (English).—Two steamers monthly each way between Buenos Ayres and Southampton, calling at Brazilian and Spanish ports, and with mails, specie, and cargo to all these ports. The voyage each way occupies about twenty-five days. Single and return tickets granted. The steamers are from 3,500 to 5,000 tons register, and in every way well equipped for the service.

Pacific Steam Navigation Company (English).—These steamers leave Liverpool twice a month for Valparaiso, touching at Bordeaux and Brazilian ports, Montevideo, and thence a special service by river boats to Buenos Ayres. Returning from the Pacific, they touch at Montevideo, Brazilian, and Spanish ports. Through tickets are granted to New York, via the Cunard line from Liverpool. The steamers are from 3,500 to 4,500 tons register. During the yellow fever season in Brazil every alternate steamer leaves direct for the River Plate.

Lamport & Holt Line (English).—The passenger steamers of this line no longer come to the River Plate, but make their voyages between Liverpool or Antwerp and Rio Janeiro; and between New York and Rio Janeiro twice a month. The freight steamers, a large fleet of them, receive cargoes to and from all European ports and Buenos Ayres; these steamers generally have accommodation for a few first-class passengers.

Besides these old established English lines, there have been placed on the route between English or continental ports and the River Plate, within the last few years, several cargo lines of steamers, the most important of which are the following, viz, the MacIver Line, the Mac-Andrew Line, the Nelson Line, the Prince Line, the Houlder Line, the River Plate Meat Company's Line, the Holland Line, the Houston Line, and the Allan Line. The most of the steamers of these lines are prepared to take a few first-class passengers.

Chargeurs Réunis Company (French).—These steamers leave Dunkirk and Havre for the River Plate, and vice versa, twice a month, touching at Spanish ports coming and at Brazilian ports returning. They are of 3,000 tons register and have excellent accommodations for passengers.

Company of the Messageries Maritimes (French).—This line of steamers runs between Bordeaux and Buenos Ayres twice a month. They touch at Spanish ports coming and at Brazilian ports returning. They have first-class appointments for passengers, and sell return tickets at a reduction.

General Steam Transportation Company (French).—The service of this line of steamers (Société Générale de Transports Maritimes à Vapeur)

is from Naples, Genoa, Marseilles, Barcelona, Dekar to Buenos Ayres and return, touching at Brazilian ports. They leave each end of the route once a month, and are well fitted for first, second, and third class passengers.

La Veloce Steam Navigation Company (Italian).—The steamers sail twice a month from Naples, Genoa, and other Italian ports to the River Plate, touching at Marseilles, Barcelona, etc., on the passage out, and at Brazilian ports returning. They have from 4,000 to 5,000 tons register, and are, in every respect, splendid steamers, swift and admirably equipped.

General Italian Steam Navigation (United Florio and Rubattino) Company.—These steamers ply between Genoa and Buenos Ayres and the principal intermediate ports twice a month. They are all large and handsome steamers, with excellent accommodations for first and third class passengers.

Italian Navigation Company.—The steamers of this line make bimonthly passages between Genoa and the River Plate, touching at all important intermediate ports in France, Spain, and Brazil.

Imperial North German Lloyds Company.—This line plies between Antwerp and Buenos Ayres, touching at Southampton, Bremen, Vigo, etc., without calling at any Brazilian ports. The steamers are new, well equipped, and swift. Their sailings at each end of the line are bimonthly.

The Bremen and La Plata (Hansa) Company.—These steamers have regular fortnightly sailings between Antwerp and Buenos Ayres, calling at Antwerp, Hamburg, Rotterdam, and other ports when required. They are freight boats, but have accommodations for a few passengers.

Hamburg-South American Steamship Company.—This is called the "regular German mail line," and its steamers sail between Hamburg and the River Plate and all important intermediate ports, receiving cargo for Bremen and ports of Denmark, Sweden, and Norway, and on the homeward passage calling at Rio Janeiro, Bahia, and other Brazilian ports; they make bimonthly passages.

The Kosmos Steamship Company.—These steamers sail twice a month between Hamburg and Antwerp and the River Plate, one steamer going to Valparaiso, on the west coast, monthly.

The Norton Line.—The steamers of this line are chartered steamers under the British flag (Norton & Son, New York; Bucknell Nephews, London). They make direct passages from New York to Montevideo and Buenos Ayres, without touching at Brazilian ports. Returning from the River Plate they call at Rio Janeiro. They have ample accommodations for cargo, and are well equipped for a limited number of first-class passengers. They make bimonthly passages each way.

Knott's Prince Line.—This line, besides its steamers between the River Plate and the European continent, has a special service between the River Plate and New York, a steamer sailing from each end every two weeks. They are cargo boats, but have accommodations for a

limited number of passengers. They call on the northward route at Santos, Rio Janeiro, Bahia, and Pernambuco.

Lamport & Holt Line.—Once a month there is a freight steamer of this company leaving the River Plate for New York, and one from New York direct for Buenos Ayres, with accommodations for a few passengers.

Passage rates.—The rates for passage vary somewhat on these different lines according to the rank of the steamers and any special accommodations they may offer. Those of the Royal Mail Company, between Southampton and Buenos Ayres, are from £30 to £35 ($145.98 to $170.31) for first-class passengers; and £20 ($90.32) for second class. Those of the Pacific Navigation Company, between Liverpool and Buenos Ayres, are a trifle less. The rates of the French line, Messagaries Maritimes, are 750 francs ($144.75) for first class, 350 francs ($67.55) for second class, and 150 francs ($28.95) for third class, between Bordeaux and Buenos Ayres; of the Chargeurs Réunis, the rates are $150 for first class, $70 for second class, and $30 for third class, between Havre and Buenos Ayres. The rates by the German lines are $150 to $175, between German ports and Buenos Ayres for first-class passages. Between Italian ports and the River Plate, the rates by the Italian lines are about the same. The rates between New York and Buenos Ayres, by the Norton Line, are $160 for first class and $60 for second class passengers; and by the Prince Line the passages are about the same figures.

Freight.—In regard to the number of vessels employed by each of these several lines, or owned by the respective companies, I am not able to say, and the information had better be sought from the home offices in Europe. The number of passenger steamers, however, of the different companies is amply sufficient at all times for the service they perform. As to the freight steamers, the companies in most cases not only trade with the River Plate, but do a general cargo business in Atlantic waters, and have such large fleets that they can, by cable, at any time place additional vessels wherever they may be needed. In the matter of cargo, either from Europe or from the United States to the River Plate, there are no regular or uniform rates. The amount of cargo offering in this direction is just now so limited in amount, compared with the tonnage offered, that the companies accept what they can get. And this is also the case with freights from the Argentine Republic. There is always so much steam tonnage offered at this end of the several lines, that the companies can not be said to have any fixed rates. Indeed, cargo steamers have, in many instances lately, adopted the custom of sailing vessels, and are now content to get "lump sums."

COASTWISE LINES.

In regard to "great coastwise lines" of steamers, there is but very little to be said. Along the great stretch of coast from Buenos Ayres down the Atlantic, there is no regular service of steamers. The Argen-

tine Government, however, has arranged for a naval transport, or a chartered steamer to leave here once a month with supplies and provisions for the various sub-prefecturas or custom-house stations of Patagonia and Tierra del Fuego, touching at Bahia Blanca, Carmen de Patagones, Port Desire, Chupat, Rio Santa Cruz, States Island, and Ushuiua. Now and then, private steamers, carrying cargo and passengers, make return trips to those outlying ports of Argentine civilization, but it can not yet be stated that there is any regular line. Rates of freight and passage are, of course, conventional.

RIVER STEAMERS.

There are several regular river lines of steamers, which ply between Montevideo and Buenos Ayres, making daily trips, leaving each port in the afternoon and reaching the other in the early morning. In this service, the boats are Clyde built, quite commodious, and fitted up with all the latest conveniences and improvements, in these respects corresponding to our own coast line steamers.

There are likewise regular steamers running three times a week up the Parana River between Buenos Ayres and Asuncion, Paraguay, and between Buenos Ayres and Salto on the Uruguay River, touching at all intermediate ports. These river boats generally offer good accommodations.

There can not be said to be any fixed and uniform rates for freight on these river boats. They charge what they can get. The price of a first-class passage between Buenos Ayres and Montevideo is $6 (gold); second class, $4. The price of a first-class passage to Asuncion is $50; for round trip, $80. The price of a first-class passage to Salto is $8; for the round trip, $14. Freights to Montevideo per ton are $2; to Salto, $3, and to Asuncion, $4.50 (gold) per ton.

RAILWAYS.

So far as "great through lines of railways" are concerned, I have to premise that there is really nothing in the Argentine Republic which can be so designated. There are a number of well-equipped railways running out of Buenos Ayres, and also a number running out of Rosario, whose tracks or whose connections with other roads extend into the interior of the country, but none of them go "through." They all stop somewhere, as we say, "in the woods," and hence none of them can be considered as "great highways of traffic and travel." The nearest approaches, however, which this country has to through lines are the following:

Buenos Ayres, Rosario and Tucuman Route.—As the connecting points of this route indicate, it runs northward direct, about 1,000 miles, taking in a number of important towns on the way, but it stops at Tucuman. Beyond the latter place the Government is constructing a narrow-guage road to Salta and Jujuy. The line is really composed of

three different roads, each one of which has its own distinct arrangements for passengers and for traffic, though all cars go through without change or break. The companies are all in private hands, whose headquarters are in London. The fare to Tucuman, first class, is $65; second class, $37.45 (currency).

Eastern Argentine Route to Tucuman.—This line starts also at Buenos Ayres, taking in Rosario, whence it runs northwestward to Cordoba, and thence on to Tucuman. From Cordoba, however, the track is narrow guage, so that all freights have to be rehandled at that point. The line is composed, also, of at least three different managements. The length of the route is nearly 1,200 miles, but there are no combination rates, each road exacting its own schedule for both freight and passage.

Buenos Ayres and Pacific.[1]—The line thus designated, owned by a private English company, has its road open to business as far as Mendoza, though it is nearly ready to be opened for about 50 kilometers beyond, toward the frontier of Chile. It has a section also in operation from Mendoza to San Juan. Through passengers to Chile cross the mountains by the Uspallata Pass on muleback, the road being open during the summer months. The distance to Mendoza is about 600 miles, but no through freights are taken. The only trade, however, at present, is in horses, mules, and cattle, which go across on the hoof. The fare to Mendoza, first class, is $57.40; second class, $35.70 (currency). The present length of the road is 685 kilometers (425.6 miles).

Buenos Ayres and Great Western.—This line was formerly the property of the Province of Buenos Ayres, but has lately been sold to a private English company. The road now has an extension into the western pampa as far as Trenqua Lanquen, a small town of no importance, except that it is the present terminus of the road. The present

---

[1] This road is also known as the Transandine. Minister Strobel, in a dispatch to the Department from Santiago, Chile, dated February 21, 1895 (printed in Consular Reports, May, 1895, p. 181), says:

"Before the adjournment of the Chilean Congress, on the 9th instant, a law was passed which guarantees, for twenty years, to the Transandine Railway Company interest at the rate of 4½ per cent per annum on a capital £1,300,000. The English capitalists with whom the holders of the concession (Messrs. Clark Bros., resident in this country) have been negotiating, in order to raise the amount required to complete the road, have been demanding, for some time past, a guaranty of 5 per cent, but the Chilean Congress would not go beyond the rate mentioned of 4½ per cent. As work is being continued on the Argentine side, the hope is generally entertained here that, with the passage of this law, sufficient capital will be obtained for the completion of the entire road by both countries within a few years. The uncompleted portion, however, comprises the most difficult part of the road, and will require almost continual tunneling. The line on the Argentine side is finished as far as Punta de Vacas, and on the Chilean side as far as Salto del Soldado. This leaves at present unfinished about 75 kilometers (46.6 miles), almost equally divided between the two Republics, this distance being at present traversed in seventeen hours—twelve by coach and five on muleback—the whole trip from Valparaiso to Buenos Ayres occupying four days. When the line is finished, it is expected that the journey will be reduced to seventy-two hours."

length of the road is 513 kilometers (318.7 miles). The fare to Trenqua Lanquen, first class, is $21.50; second class, $14.50 (currency).

Buenos Ayres and Southern.—This road, with its lateral branches, exceeds in length any other road in the country. It is all under a single management, and is owned by an English company whose chief office is in London. From Buenos Ayres it has a double-track trunk line to Altamirana, where it divides into two roads to Bahia Blanca; one passing through Chascomus, Dolores, Maipa, and Tandil, with branches to Mar del Plata and to Necochea, two watering places on the Atlantic coast, and the other passing through Canuelas, Las Flores, Azul, etc. The freight traffic on both these lines is entirely local. The fare to Bahia Blanca, first class, is $27.80; second class, $19.20 (currency).

These are the only roads in the Argentine Republic which can be dignified into the category of "through roads." In regard to freights upon any of them, each road has its own tariff, in currency, which changes as the premium in gold goes up or down. As for combination rates, the thing is unknown in this country. Each company exacts freight according to its own tariff. Thus far, the National Government has not intervened to regulate "interstate commerce," i. e., traffic between the different Argentine Provinces, and the point has been raised that there is nothing in the constitution which permits the General Government to interfere in the regulation of interstate passenger and traffic rates.

There are no canals in the Argentine Republic.

E. L. BAKER,
Consul.

BUENOS AYRES, *October 11, 1894.*

EUROPE.

GREAT BRITAIN.

RAILWAY SYSTEM OF ENGLAND.[1]

Railways had their origin in the tramways which were laid more than two hundred years ago in the mineral districts of England for the conveyance of coal to the sea.

In those days, before Macadam, roads bearing heavy traffic were with difficulty kept in repair. This led to the plan of laying planks or timbers at the bottom of the ruts as a better contrivance than filling in with stones, and then to laying rails of timber on the level surface. In 1676, tramways consisted of rails and timber laid "from the colliery to the river, exactly straight and parallel, and bulky carts were made with four rollers fitting the rails, whereby the carriage was so easy that one horse could draw 4 or 5 chaldrons of coals." Cast iron was first tried incidentally as a material for rails in 1767 by the Coalbrookdale Iron Company. The iron rails were cast in lengths of 5 feet, 4 inches wide and $1\frac{1}{4}$ inches thick, with three holes, through which they were fastened to the oak rails.

The tramway was developed into the railway by the employment of cast-iron flange rails to replace the wooden rails; the continuous flange or ledge on their inner edge kept the wheels on the track. The roads were then called tramroads, probably as an abbreviation of trammel roads, the flanges of the rails being in reality trammels to gauge the road and confine the wheels to the track.

The benefits derived from the use of the tramway or railway for the transport of coal suggested to reflective persons the employment for it for the conveyance of general merchandise and of passengers.

For the conveyance of heavy merchandise inland, the canals, a little more than sixty years ago, furnished the principal means. Though there were three such water routes between Liverpool and Manchester, they were sometimes so crowded that cotton took a month to pass from the seaport to the manufacturing towns in the interior; yet the whole of the merchandise passing between Liverpool and Manchester did not average more than 1,200 tons a day. The average rate for car-

[1]Authorities: D. K. Clark, C. E.; Prof. A. T. Hadley, S. W. Dunning, and others.

riage was 18s. ($4.38) per ton, and the average time of transit on the 50 miles of canal was thirty-six hours.

The conveyance of passengers by the improved coach roads was comparatively rapid, but it was very costly. The first great movement to mend this state of things was the passing of the act of 1821 for the construction of the Stockton and Darlington Railway. By another act, applied for at the request of George Stephenson, who became the engineer to the line, the company was empowered to work the railway with locomotive engines.

The line, with three branches, was over 38 miles in length, and was at first laid as a single line, with passing places at intervals of a quarter of a mile, the way being constructed with wrought-iron fish-belly rails weighing 28 pounds per yard. It was opened in September, 1825, by a train of thirty-four vehicles, making a gross load of about 90 tons, drawn by one engine driven by Stephenson, with a signalman on horseback in advance. The train moved off at the rate of from 10 to 12 miles an hour, and attained a speed of 15 miles per hour on favorable parts of the line.

A train weighing 92 tons could be drawn by one engine at the rate of 5 miles per hour. The principal business of this new railway was the conveyance of minerals and goods; but from the first, passengers insisted upon being carried, and in October, 1825, the company began to run a daily coach called the "Experiment," to carry six inside and from fifteen to twenty outside, making the journey from Darlington to Stockton and back in two hours. The fare was 24 cents, and each passenger was allowed to take baggage not exceeding 14 pounds weight. The rate for carriage of merchandise was reduced from 10 cents to about three-eighths of a cent per ton per mile, and that of minerals from 14 cents to 3 cents per ton per mile. The price of coals at Darlington fell from 18s. ($4.38) to 8s. 6d. ($2.06) per ton.

The Monklands Railway in Scotland, opened in 1826, was the first to follow the example of the Stockton and Darlington line, and several other small lines, including the Canterbury and Whitestable, worked partly by fixed engines and partly by locomotives, quickly adopted steam traction. But the inauguration of the Liverpool and Manchester Railway, opened in 1829, made the first great impression on the national mind that a revolution in the modes of traveling had really taken place.

While retaining their original title of "railway" companies, the great British corporations do much more than provide highways, locomotive power, and rolling stock for rail carriage.

The railway companies of the United Kingdom own nearly 21,000 miles of line (more than one-half of which consists of two or more tracks), over 18,000 engines, and about 654,700 vehicles of all kinds. In goods traffic, they collect, deliver, load, unload, warehouse, and insure freight, owning for these purposes an enormous apparatus of warehouses, cranes, vans, lurries, horses, stables, etc.

For passengers, they provide conveniences of all sorts en route and at stations. To facilitate transport, and to compete more successfully with one another, they have acquired and work steamboats, canals, dock and road coaches. They are manufacturers on a large scale of engines, vehicles, rails, signal appliances, etc., for their own use. They own and work electric-lighting, oil-gas, and printing works. On them depend the most typical modern institutions—the cheap postal and telegraph service and the daily press. Still, the transportation of passengers and goods remains the raison d'être of railways and the main source of revenue. Freight traffic is the more important, bringing in $199,500,400 in 1893, as against $174,461,343 from passengers, and $18,433,357 from rents, canals, steamboats, etc. How well the United Kingdom is served by its railway companies, may be gathered from the fact that in England, in 1892, the total train movement was 22½ trains each way every day over every mile of railway, which is three times as many as in the United States.

As they depend mainly on one or other of the above-named sources of revenue, the thirty-one principal railways of the United Kingdom can be best classified thus:

The Southeastern, London, Chatham and Dover, London, Brighton and South Coast, and the Southwestern may be called passenger lines, as each receives over $14,600 per mile per annum from that source and under $9,733 from goods.

The Northeastern, Manchester, Sheffield and Lincolnshire, North Stafford, Caledonian and North British are "goods" lines, receiving over $9,733 per mile from freight traffic, and under that amount from passengers. The London and Northwestern, Great Northern, and the Midland each earn about $17,032 from goods traffic, and over $9,733 from passengers; these are generally called the "heavy" lines.

The Lancashire and Yorkshire Railway (of which I give a detailed report below), alone receives over $14,600 per mile from both classes, its system lying among many large towns. In total receipts per mile per annum, the Lancashire and Yorkshire easily leads with $41,364; the Midland, London and Northwestern, Great Northern, London, Brighton and South Coast, London, Chatham and Dover, and the Manchester, Sheffield and Lincolnshire all earning over $29,198. On the other hand, the Great Western does not get $19,466 per mile altogether, and the Great Eastern barely exceeds that figure.

By virtue of its services to Scotland, Wales, and Ireland, and to Liverpool (for the United States), the London and Northwestern is the most important as it is the richest of the British railways (length, 1,888½ miles). The Great Western is the longest (2,482 miles); the Great Northern has the best reputation for speed, and the Midland serves the greater number of important towns, and is incomparably the best managed and most carefully conducted road in Great Britain.

Nearly sixty years ago, Porter, in his "Progress of the Nation: 1836," estimated that in Great Britain 82,000 persons daily, or 30,000,000 per annum, traveled by coach an average distance of about 12 miles each. at an average cost of $1.22 each passenger, or 10 cents per mile; whereas in 1893, over 873,000,000 separate passenger journeys were taken on the railways of the United Kingdom, being 23 for each man, woman, and child of the population (to this number should be added, perhaps, 450,000,000 journeys taken with season or periodical tickets), the average fare being, according to a high authority. about 3 farthings (1½ cents) per mile.

Ninety per cent of ordinary travel in this country is now in the third class; and in 1893 first-class travel declined 3.4 per cent in numbers and 3 per cent in receipts, and second class 8.4 per cent in numbers and 13.7 per cent in receipts. Meanwhile, third-class travel increased 1.4 per cent in numbers and 1.8 per cent in receipts.

Of the thirty-one principal lines of railway in the United Kingdom, only two have their headquarters in the city of Manchester. They are the Lancashire and Yorkshire Railway, and the Manchester, Sheffield and Lincolnshire Railway.

LANCASHIRE AND YORKSHIRE RAILWAY.

The Lancashire and Yorkshire Railway has its termini at Liverpool in the west, Hull in the east, Bradford and Leeds in the north, and Doncaster in the south.

This company owns 485 miles of track, and leases or rents another 42 miles, making a total of 527 miles.

The following table gives the main stations on this line of railway, with the distances and the fares for first-class passengers, between Manchester and those stations. Third-class fares are about half the first class:

Manchester to—	First-class fare.		Distance	Manchester to—	First-class fare.		Distance.
	English rate.	United States equivalent.			English rate.	United States equivalent.	
	s. *d.*		*Miles.*		*s.* *d.*		*Miles.*
Accrington	3 7	$0.87	22¾	Holmefirth	5 3	$1.27	45¾
Bacup	3 4	.81	21¾	Huddersfield	5 0	1.21	39¾
Blackburn	4 6	1.09	24½	Hull	12 3	2.98	99
Blackpool	6 0	1.46	48¾	Leeds	7 0	1.70	49
Bolton	2 0	.48	10¾	Liverpool	5 6	1.33	36½
Bury	1 6	.36	9½	Lytham	6 0	1.46	44½
Bradford	6 3	1.52	41	Middleton	0 10	.20	6¼
Burnley	4 7	1.11	28	Oldham	1 0	.24	8
Chorley	4 0	.97	22¼	Preston	5 6	1.33	30¾
Clitheroe	6 3	1.52	35¼	Rochdale	1 10	.44	10¾
Colne	5 6	1.33	34¼	St. Annes	6 0	1.46	47½
Darwen	3 8	.89	20½	Southport	5 0	1.21	34¾
Doncaster	8 10	2.14	70¾	Todmorden	3 4	.81	19¼
Fleetwood	6 0	1.46	51¼	Wakefield	6 9	1.64	47¾
Goole	9 3	2.25	75	Wigan	2 9	.66	18
Halifax	5 3	1.27	32				

The condition of the line is, like that of all the leading railways in the Kingdom, good throughout. The line varies in places from one track to three. The communication upon the greater part of the line is almost incessant.

MANCHESTER, SHEFFIELD AND LINCOLNSHIRE RAILWAY.

This railway, with its central terminus in Manchester, runs as far as Liverpool in the west, Grimsby in the east, Wakefield in the north, and Lincoln and Annesley in the south, covering 350 miles of track, and 207½ miles in conjunction with other railways, making a total of 557½ miles. This company is now extending its line from Annesley—its lower southern point—to London, at an estimated cost of $282,257 per mile, the 4½ miles within the London area working out at no less than $2,638,382 each mile.

The following table shows the distances between Manchester and the principal points along the line, together with the fare for first-class passengers:

Manchester to—	First-class fare.		Distance.	Manchester to—	First-class fare.		Distance.
	English rate.	United States equivalent.			English rate.	United States equivalent.	
	s. *d.*		*Miles.*		*s.* *d.*		*Miles.*
Barnsley	4 9	$1.15	36	Macclesfield (C.L.C.)	3 0	$0.73	19¾
Chester (C. L. C.)	6 0	1.46	38¾	Penistone	3 10	.93	28¼
Chesterfield	7 4	1.78	*a* 60	Retford	8 7	2.08	64½
Doncaster	6 10	1.66	52½	Rotherham	5 11	1.43	47
Grimsby	12 3	2.98	109¼	Sheffield	5 7	1.35	41¼
Grimsby Docks	12 3	2.98	110¼	Southport	5 0	1.21	49½
Liverpool (C. L. C.)	5 6	1.33	34	Warrington	2 9	.66	15¾
Lincoln	11 1	2.69	84	Wakefield	6 9	1.64	51¼

a About.

The condition of the line is good throughout; the tracks vary from one to three, and the communication is almost incessant.

RAILWAY CARRIAGES AND WAGONS.

The common varieties of vehicles employed in railway traffic are:

(1) Passenger train stock: First-class carriage, second-class carriage, third-class carriage, composite carriage, luggage brake van, horse box, and carriage truck. To these, may be added the mail carriage or traveling post-office.

(2) Goods train stock: Platform wagon, open or box wagon, high-sided round-end wagon, covered goods wagon, cattle wagon, sheep wagon, coal wagon, coke wagon, and brake van.

Passenger carriages.—The early first-class carriages weighed 3¼ tons, the bodies or upper parts being 15 feet long, 6½ feet wide, and 4 feet 9 inches high, divided into three compartments to hold six passengers each, or eighteen in all. They now weigh from 8 to 13 tons each, and

are from 20 to 30 feet in length and 8 to 8½ feet wide. Carriages have, until recent years, been placed almost all on four wheels, but six wheels on three axles are now generally in use. A modern first-class carriage 28 to 30 feet long, with four compartments, gives 7 to 7½ feet of total length for each compartment, as against 5 feet in the early carriages. Second and third class carriages, in length from 28 to 31 feet, are divided into five compartments, each from 5 feet 7 to 6 feet 2 inches long.

Second-class carriages, originally, were destitute of cushioning, hard and square, on the nearly obsolete policy of making them uncomfortable in the hope of inducing passengers to travel first class. The London, Brighton and South Coast Railway Company in 1857–58 was the first to supply comfortably padded seats in its second-class carriages, and the receipts of that company were in 1858 materially augmented in consequence. Third-class carriages have been improved under the stimulating example of the Midland Railway Company, which abandoned its second-class carriages and raised its third-class stock to an equality with the second-class vehicles of other lines.

First-class compartments are constructed to seat six persons, three on each side; third-class compartments seat ten persons, five on each side. A uniform width of 8 feet outside, or 7½ inside, is adopted for all carriages, and, as a rule, first-class compartments are 7½ feet long between the partitions, and third-class 6 feet long. The roof is 7 feet 4 inches above the floor in the center, and the clear height of the doorway is 6 feet. The wheels are 3 feet 7 inches in diameter. Every first-class passenger on the best lines now has about 90 cubic feet of space allowed him (the Great Western Railway gives over 95 cubic feet), as against 26 cubic feet a generation ago.

Pullman cars were first imported from the United States by the Midland Railway Company in 1874 (the Midland own upward of thirty-four of these, some being sleeping cars, but the majority drawing-room and dining cars; they cost $13,139.55 each), and they have also been adopted by the Brighton, Great Northern, and the Southwestern systems. As a rule, a small extra charge is made, for sleeping berths only. Dining cars are in use on the Midland, Great Northern, London and Northwestern, and Great Eastern lines.

In the lighting and heating of cars, great improvements have been made, the Pope system of oil-gas lighting having been adopted on many lines, and the old-fashioned foot warmer superseded by a system of heating by steam from the locomotive.

RATES OF FREIGHT.

Ever since railways were in the United Kingdom, the principle has obtained that Parliament should fix the maximum tolls and fares for any traffic passing over the line. In 1854, the first railway and canal traffic act was passed, followed by a second in 1873, and a third in 1888.

Under the act of 1888, a permanent railway commission was appointed, to hold sittings in England, Scotland, and Ireland, with a judge of each country as its ex officio president, and two special members, one experienced in railway business, each having a salary of $14,600 a year. Below, I give the classification of merchandise in alphabetical order, together with the maximum rates and charges according to the "railway rates and charges order confirmation acts of 1891 and 1892," of the two railways whose centers are in this consular district, viz, the Manchester, Sheffield and Lincolnshire Railway and the Lancashire and Yorkshire Railway.

The following schedule of maximum rates and charges is divided into six parts:

Part I contains the maximum rates and charges authorized in respect of the merchandise comprised in the several classes of merchandise specified in the classification.

Parts II and III contain the maximum rates and charges authorized in respect of animals and carriages as therein described.

Part IV specifies the exceptional charges mentioned in such part, and the circumstances in which they may be made.

Part V contains the rates and charges authorized in respect of perishable merchandise by passenger train, with the provisions and regulations which apply to such merchandise.

Part VI contains the rates and charges authorized in respect of small parcels by merchandise train, with the provisions and regulations which are to apply to such parcels.

PART I.—GOODS AND MINERALS.

MANCHESTER, SHEFFIELD AND LINCOLNSHIRE RAILWAY, ETC.

Railway rates and charges applicable to the following railways and railway companies:

The Manchester, Sheffield and Lincolnshire Railway Company.

The Liverpool, Southport and Preston Junction Railway Company.

The Macclesfield Committee.

The Manchester, Sheffield and Lincolnshire and the Great Northern Railway companies, in respect of the West Riding and Grimsby Railway.

The Manchester, Sheffield and Lincolnshire, the Great Northern, and the Midland Railway companies, in respect of the Cheshire Lines railways.

The Manchester, Sheffield and Lincolnshire, the Great Northern, the Midland, and the Southport and Cheshire Lines Extension Railway companies, in respect of the Southport and Cheshire Lines Extension Railway.

The Manchester, Sheffield and Lincolnshire and the London and Northwestern Railway companies, in respect of the Manchester South Junction and Altrincham Railway.

The Manchester, Sheffield and Lincolnshire and the London and Northwestern Railway companies, in respect of the Oldham, Ashton, and Guide Bridge Junction Railway.

The Manchester, Sheffield and Lincolnshire and the Midland Railway companies, in respect of the Sheffield and Midland Committee lines.

The Wigan Junction Railway Company.

SCALE I.—Maximum rate for conveyance, per ton per mile, 1.25d (2½ cents). Applicable to the Oldham, Ashton and Guide Bridge Junction Railway, in respect of merchandise in Class A.

SCALE II.—Maximum rates for conveyance, per ton per mile, for consignments, except as otherwise provided in the schedule, in respect of merchandise comprised in the under-mentioned classes. Applicable to the Macclesfield Committee in respect of merchandise in Classes A and B.

Class.	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.	
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
A	1.15	2¼	0.90	1¾	0.45	⅞	0.40	¾
B	1.25	2½	1	2	.80	1⅝	.50	1

SCALE III.—Maximum rates for conveyance, per ton per mile, for consignments, except as otherwise provided in the schedule, in respect of merchandise comprised in the under-mentioned classes. Applicable as hereinbefore specially mentioned.

Class.	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.	
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
A	1	2	0.85	1¾	0.50	1	0.40	¾
B	1.40	2¾	1	2	.80	1⅝	.50	1
C	1.80	3⅝	1.50	3	1.20	2⅜	.70	1⅜
1	2.20	4⅜	1.85	3¾	1.40	2¾	1	2
2	2.65	5¼	2.30	4⅝	1.80	3⅝	1.50	3
3	3.10	6¼	2.65	5¼	2	4	1.80	3⅝
4	3.60	7¼	3.15	6¼	2.50	5	2.20	4⅜
5	4.30	8⅝	3.70	7⅜	3.25	6½	2.50	5

LANCASHIRE AND YORKSHIRE RAILWAY, ETC.

SCALE I.—Maximum rates for conveyance, per ton per mile, for consignments, except as otherwise provided in the schedule, in respect of merchandise comprised in the under-mentioned classes. Applicable to such railways as are not hereinafter specially mentioned.

Class.	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.	
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
A	1	2	0.85	1¾	0.50	1	0.40	¾
B	1.40	2¾	1	2	.80	1⅝	.50	1
C	1.80	3⅝	1.50	3	1.20	2⅜	.70	1⅜
1	2.20	4⅜	1.85	3¾	1.40	2¾	1	2
2	2.65	5¼	2.30	4⅝	1.80	3⅝	1.50	3
3	3.10	6¼	2.65	5¼	2	4	1.80	3⅝
4	3.60	7¼	3.15	6¼	2.50	5	2.20	4⅜
5	4.30	8⅝	3.70	7⅜	3.25	6½	2.50	5

SCALE II.—Maximum rates for conveyance, per ton per mile, for consignments, except as otherwise provided in the schedule, in respect of merchandise comprised in the under-mentioned classes. Applicable to the Preston and Longridge Railway.

Class.	Pence.	Cents.	Class.	Pence.	Cents.
A	1.25	2½	2	2.65	5¼
B	1.40	2¾	3	3.10	6¼
C	1.80	3⅝	4	3.60	7¼
1	2.80	4⅜	5	4.30	8⅝

Provided always, that with respect of merchandise in Class A, conveyed between Dock street, Preston, and Deepdale the maximum rate for conveyance shall not exceed 2d. (4 cents) per ton.

MAXIMUM STATION AND SERVICE TERMINALS.

The following terminals are common to all the railway rates and charges orders confirmation acts of 1891 and 1892, except as hereunder mentioned, in respect of merchandise comprised in the under-mentioned classes.

[Per ton.]

Class.	Maximum terminals.				
	Station terminal at each end.	Service terminals.			
		Loading.	Unloading.	Covering.	Uncovering.
	s. *d.*	*s.* *d.*	*s.* *d.*	*d.*	*d.*
A	0 3	.....	.....	.....	.....
B	0 6	.....	.....	.....	.....
C	1 0	0 3	0 3	1	1
1	1 6	0 5	0 5	1½	1½
2	1 6	0 8	0 8	2	2
3	1 6	1 0	1 0	2	2
4	1 6	1 4	1 4	3	3
5	1 6	1 8	1 8	4	4

PART II.—ANIMAL CLASS.

The following scale is common to all the railway rates and charges orders confirmation acts of 1891 and 1892, with the exception of the Scottish railways acts and the Irish railways act:

[English money and United States equivalents.]

Description.	Rate for conveyance per mile.								Station terminal at each end.		Service terminals.				Minimum total charge per consignment.	
	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.				Loading.		Unloading.			
	d.	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*s.* *d.*	*cts.*	*s.* *d.*	*cts.*	*s.* *d.*	*cts.*	*s.* *d.*	
For every horse, mule, or other beast of draft or burden	3	6	3	6	1.65	3¼	1.65	3¼	0 6	12	0 4	8	0 4	8	2 6	$0.60
For every ox, cow, bull, or head of neat cattle	2	4	2	4	1.30	2⅝	1.30	2⅝	0 4	8	0 3	6	0 3	6	2 6	.60
For every calf not exceeding 12 months old, pig, sheep, lamb, or other small animal	0.75	1½	0.75	1½	0.40	¾	0.35	¾	0 2	4	0 1.50	3	0 1.50	3	2 6	.60
For every animal of the several classes above enumerated conveyed in a separate carriage, by direction of the consignor, or from necessity	6	12	6	12	6	12	6	12	1 6	36	1 0	24	1 0	24	5 0	1.21
For each truck containing any consignment by the same person of such number of oxen, cows, neat cattle, calves, sheep, goats, or pigs as may reasonably be carried in a truck of 13 feet 6 inches in length, inside measurement	6	12	5	10	4.90	9¾	4.20	8¾	1 0	24	0 6	12	0 6	12	5 0	1.21

[English money and United States equivalents.]

Description.	Rate for conveyance per mile.								Station terminal at each end.		Service terminals.				Minimum total charge per consignment.	
	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.				Loading.		Unloading.			
	d.	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*s. d.*	*cts.*	*s. d.*	*cts.*	*s. d.*	*cts.*	*s. d.*	
For each truck containing any consignment by the same person of such number of oxen, cows, neat cattle, calves, sheep, goats, or pigs as may reasonably be carried in a truck of 15 feet 6 inches in length, inside measurement.	7	14	6	12	5.20	10 3/8	4.50	9	1 0	24	0 9	18	0 9	18	5 0	1.21
For each truck containing any consignment by the same person of such number of oxen, cows, neat cattle, calves, sheep, goats, or pigs as may reasonably be carried in a truck of 18 feet in length, inside measurement	8	16	7	14	6.20	12 3/8	5.50	11	1 0	24	1 0	24	1 0	24	5 0.	1.21

The terminal charges other than those payable under paragraph 4 on animals sent by the same person at a rate calculated per head, and carried in the same truck, shall in no case exceed the terminal charges per truck.

Where the company is required to cleanse and does cleanse trucks under the provision of any order in council or duly authorized regulation of any department of state, they may make a charge not exceeding 1 shilling per truck in addition to the charges herein authorized.

Part III.—Carriages.

This part of the maximum rates and charges is common to all the railway rates and charges orders confirmation acts of 1891 and 1892.

[English money and United States equivalents.]

Description.	Rates for conveyance per mile.								Station terminal at each end.		Service terminals.			
	First 20 miles, or under.		Next 30 miles, or under.		Next 50 miles, or under.		Remainder of the distance.				Loading.		Unloading.	
	d.	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*d.*	*cts.*	*s. d.*	*cts.*	*d.*	*cts.*	*d.*	*cts.*
For every carriage of whatever description not included in the classification and not being a carriage adapted and used for traveling on the railway, and not weighing more than 1 ton, carried or conveyed on a truck or platform	6	12	6	12	3.30	6 5/8	3.20	6 3/8	1 0	24	6	12	6	12
For every additional quarter of a ton which such carriage may weigh.....	2	4	2	4	1.35	2 3/4	1.25	2 1/2	.....	....	....	....	....	....

For the use of a covered carriage truck for the conveyance of any such carriage an additional charge of 10s. ($2.43).

In the Cleator and Workington Junction Railway, etc., act, the conveyance rates "For the next 50 miles" and "For the remainder of the distance" are omitted.

In the following acts, the East London Railway, etc.; the Festiniog Railway, etc.; the Isle of Wight Railway, etc.; the North London Railway, and the City of Glasgow Union Railway, the rates for conveyance are limited to those set forth in the first column of rates in the above scale.

Part IV.—Exceptional class.

This part of the maximum rates and charges is common to all the railway rates and charges orders confirmation acts of 1891 and 1892.

The following articles are subject to such reasonable charge as the company may think fit in each case:

For articles of unusual length, bulk, or weight, or of exceptional bulk in proportion to weight.

For articles requiring an exceptional truck, or more than one truck, or a special train.

For locomotive engines and tenders, and railway vehicles running on their own wheels.

For any wild beast, or any large animal not otherwise provided for.

For dangerous goods.

For specie, bullion, or precious stones.

For any accommodation or services provided or rendered by the company within the scope of their undertaking by the desire of a trader, and in respect of which no provisions are made by this schedule.

The above provisions shall not apply to pieces of timber weighing less than 4 tons each, but for all such timber when requiring two or more wagons for conveyance a minimum charge may be made as for 1 ton for each wagon used, whether carrying part of the load or used as a safety wagon only.

Part V.—Perishable merchandise by passenger train.

This part of the maximum rates and charges is common to all the railway rates and charges orders confirmation acts of 1891 and 1892.

The following provisions and regulations shall be applicable to the conveyance of perishable merchandise by passenger train:

1. The company shall afford reasonable facilities for the expeditious conveyance of the articles enumerated in the three divisions set out hereunder (which articles are hereinafter called "perishables"), either by passenger train or by other similar service.

2. Such facilities shall be subject to the reasonable regulations of the company for the convenient and punctual working of their passenger train service, and shall not include any obligation to convey perishables by any particular train.

3. The company shall not be under obligation to convey by passenger train or other similar service any merchandise other than perishables.

4. Any question as to the facilities afforded by the company under these provisions and regulations shall be determined by the board of trade.

5. Where a consignment of milk is less than 12 gallons, the company shall be entitled to charge as for 12 gallons; and where a consignment of perishable merchandise comprised in Divisions II or III is less than 1 hundredweight, the company shall be entitled to charge as for 1 hundredweight, with a minimum charge of 1 shilling.

Division I.—Milk.

Division II.—Butter (fresh), cheese (soft), cream, eggs; fish: char, grayling, lobsters, mullet (red), oysters, prawns, salmon, soles, trout, turbot, whitebait; hothouse fruit, game (dead), meat (fresh), poultry (dead), rabbits (dead), vegetables (hothouse).

Division III.—Fish (except as provided in Division II), fruit (except as provided in Division II), ice.

Maximum rates and charges for the three divisions.

[English money and United States equivalents.]

Distances.	Division I.					
	Per imperial gallon.		Per can.		Per returned empty cans.	
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
Rate for conveyance:						
Any distance not exceeding 20 miles	0.50	1	.....	.....	1.50	3
Exceeding 20 miles, but not over 50 miles	.60	1¼	.....	.....	2	4
Exceeding 50 miles, but not over 75 miles	.70	1⅜	.....	.....	2.25	4½
Exceeding 75 miles, but not over 100 miles	.90	1¾	.....	.....	2.50	5
Exceeding 100 miles, but not over 150 miles	1	2	.....	.....	3	6
Exceeding 150 miles	1.20	2⅜	.....	.....	3	6
Station terminal at each end	.....	.....	1.50	3	.....	.....
Service terminals:						
Loading	.....	.....	1	2	.50	1
Unloading	.....	.....	1	2	.50	1

Distances.	Division II.				Division III.			
	Per cwt. per mile.		Per cwt.		Per cwt. per mile.		Per cwt.	
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
Rate for conveyance:								
First 20 miles, or under	0.60	1¼	.....	.....	0.40	⅞	.....	.....
Next 30 miles, or under	.45	⅞	.....	.....	.30	⅝	.....	.....
Next 50 miles, or under	.24	½	.....	.....	.13	¼	.....	.....
Remainder of the distance	.10	¼	.....	.....	.12	¼	.....	.....
Station terminal at each end	.....	.....	0.75	1½	.....	.....	0.75	1½
Service terminals:								
Loading	.....	.....	.75	1½	.....	.....	.50	1
Unloading	.....	.....	.75	1½	.....	.....	.50	1

In the Cleator and Workington Junction Railway act, the rates for conveyance for distances beyond 50 miles are omitted.

In the following acts, the East London Railway, etc.; the Festiniog Railway, etc.; the Isle of Wight Railway, etc.; the North London Railway, and the City of Glasgow Union Railway, the rates for conveyance are limited to those set forth in the first column of the above scales.

Part VI.—Small parcels by merchandise train.

This part of the maximum rates and charges is common to all the railway rates and charges orders confirmation acts of 1891 and 1892.

1. For small parcels by merchandise train, not exceeding in weight 3 hundredweight, the company may charge, in addition to the maximum rates for conveyance, and the maximum station and service terminals, authorized by this schedule, which rates and charges are in this part together referred to by the expression "the maximum tonnage charge," the following:

Authorized additional charge per parcel.			When the maximum tonnage charge exceeds, per ton—			When the maximum tonnage charge does not exceed, per ton—		
English money.		United States equivalent.	English money.		United States equivalent.	English money.		United States equivalent.
s.	*d.*		*s.*	*d.*		*s.*	*d.*	
0	5	$0.10	—	–	.....	20	0	$4.87
0	6	.12	20	0	$4.87	30	0	7.30
0	7	.14	30	0	7.30	40	0	9.73
0	8	.16	40	0	9.73	50	0	12.16
0	9	.18	50	0	12.16	60	0	14.60
0	10	.20	60	0	14.60	70	0	17.03
1	0	.24	70	0	17.03	80	0	19.46
		.28	80	0	19.46	90	0	21.89
		.32	90	0	21.89	100	0	24.33
		8	100	0	24.33	—	–	.....

2. Where, for a parcel exceeding in weight 3 hundredweight, the maximum tonnage charge comes to less than the company are authorized, according to the above table, to charge for a parcel of 3 hundredweight in weight, the company may charge for such parcel as if its weight was 3 hundredweight.

3. A small parcel under this part of the schedule may consist of one consignment of two or more packages of merchandise comprised in the same class of the classification of not less than 14 pounds each in weight.

4. For a small parcel of less than 28 pounds in weight the company may charge as for a parcel of 28 pounds in weight.

5. For a fraction of 14 pounds in weight the company may charge as for 14 pounds in weight.

6. Any small parcel (other than a parcel of mixed groceries) containing articles belonging to different classes of the classification shall be chargeable with the maximum tonnage charge applicable to the highest of such classes.

7. If the consignor of a small parcel declines, on demand by the company, to declare to the company the nature of the contents of the small parcel before or at the time when the same is delivered to the company for conveyance, the company may charge for the parcel as if it was wholly composed of articles comprised in class 5 of the classification.

8. Nothing in this part of this schedule shall apply to returned empties.

WILLIAM F. GRINNELL,
Consul.

MANCHESTER, *March 28, 1895.*

STATISTICS OF BRITISH RAILWAYS.[1]

The following table shows the total length of British railways open at the end of the years given, and the average yearly increase in miles:

Year.	Line open.	Average yearly increase.	Year.	Line open.	Average yearly increase.
	Miles.	*Miles.*		*Miles.*	*Miles.*
1850	6,621	265	1880	17,933	240
1860	10,433	381	1890	20,073	214
1870	15,537	510	1893	20,646	191

Of the total length of line open January 1, 1894, there belonged to England and Wales 14,440 miles, to Scotland 3,215 miles, and to Ireland 2,991 miles.

The following table gives the length of line open, the capital paid up, the number of passengers conveyed, and the traffic receipts of all the railways of the United Kingdom in 1878, and of the five years to 1893:

Year.	Length of line open at the end of each year.	Total paid-up capital (shares and loans) at the end of each year.	Number of passengers conveyed, exclusive of season ticket holders.	Receipts.		Total receipts, including miscellaneous receipts.
				Passenger.	Freight.	
	Miles.					
1878	17,333	£698,545,154	565,024,455	£26,889,614	£33,564,761	£62,862,674
1889	19,943	876,595,166	775,183,073	32,630,724	41,086,333	77,025,017
1890	20,073	897,472,026	817,744,046	34,327,965	42,220,382	79,948,702
1891	20,191	919,425,125	845,463,668	35,130,916	43,230,717	81,860,607
1892	20,325	944,357,320	864,435,388	35,662,816	42,866,498	82,092,040
1893	20,646	971,323,323	873,177,052	35,845,449	40,994,637	80,631,892

[1] Compiled from the Statesman's Year Book for 1895.

Of the total capital at the end of 1893, the English railways had £800,680,677 ($3,896,112,174); Scottish, £131,884,101 ($641,745,835), and Irish, £38,758,575 ($188,599,226). In the division of the receipts of 1893, England and Wales took £68,252,504 ($332,114,484); Scotland, £9,130,718 ($44,430,074), and Ireland, £3,248,670 ($15,808,628). The working expenditures amounted to £45,695,119 ($222,352,449) on all the railways, being 57 per cent of the total receipts.

EARLY ENGLISH RAILWAYS.[1]

The historical account of the navigable rivers, canals, and railways throughout Great Britain, compiled by Joseph Priestley, and published in the year 1831, gives something like sixty separate titles of railways then constructed or projected. It will, of course, be well understood that these were vastly different in length, capacity, and fashion of working from their successors of the present day.

The writer has in his possession a photograph of one of the early trains, taken from an engraving of the year 1812, and representing the occasion when, to quote from an inscription written upon the print, in a hand more bold than elegant:

> June 24, 1812, the fly engine come to the Bird in hand and Leeds with 8 waggons.

The "fly engine" presented has a large cogwheel at one side, which, engaging in a row of teeth laid along the track, propels the engine and the "8 waggons" attached to it at the rate, we are further told, of "3½ miles an hour on a level railroad." What its capacity for speed might be on a steep grade is left to be conjectured.

The threescore railroads existing or contemplated in 1831 were not very far advanced in facilities beyond the 3½ miles an hour fly engine; although the Rocket locomotive had been turned out by Stephenson in 1829, and the months in that era were capable of counting progress with the years which had preceded it.

These railroads of 6 and 10 miles in length, as already indicated, had been adopted from the tramways of the coal mines; and they were operated first by horse power, and later on by machines such as the "fly engine" of the Middleton road here at Leeds referred to above. They were soon, however, to be developed into 1,500 and 2,000 mile lines and the 60-mile speeds which have come after them. Little more than three-quarters of a century has passed since the Middleton fly engine was deemed worthy of having its portrait made; and railroads are now quite other than they were. Their elder sisters, the canals, however, have had no such progress. In many cases, they remain to-day essentially as they were left by the men who constructed them. A witness before the select committee on canals in 1883 says the existing canals were constructed when railways were unknown, and are entirely behind the needs of the times; and that they must be improved

---

[1] From Special Consular Reports "Canals and Irrigation."

before they can compete with railways. Another witness states that the locks and waterways of canals are altogether wanting in uniformity; scarcely two canals have a common gauge. Even on the same canal, there may be two or three different gauges of locks. Almost every engineer who made a canal seems to have adopted a different gauge, although they may form portions of a continuous route.

With such conditions as are set forth in this evidence and elsewhere, the short links originally built for merely local use, the irregular and in many instances the insufficient dimensions which often even now remain unaltered, the lack of cooperation in management following on the divided ownership, and the absence of through routes—some or all of these elements separately or in combination have sufficed to exercise a malefic influence to interfere with and sometimes to prevent the profitable operation of these waterways.

BRITISH CANALS.

The Statesman's Year Book for 1895 gives the following table, which shows for 1888 (the latest available statistics) the length, traffic, revenue, and expenditure of the canals of England and Wales, Ireland, and Scotland:

Division.	Length.	Trade.	Revenue.	Expenditure.
Canals not belonging to railways:	*Miles.*	*Tons.*		
England and Wales	2,026	27,715,875	£1,439,343	£861,068
Scotland	69	69,744	12,011	16,086
Ireland	513	489,194	89,369	71,541
Total	2,608	28,274,813	1,540,723	948,695
Canals belonging to railways:				
England and Wales	1,024	6,609,304	437,080	335,503
Scotland	84	1,386,617	57,178	26,599
Ireland	96	30,386	6,495	4,456
Total	1,204	8,026,307	500,753	366,558
Grand total	3,812	36,301,120	2,041,476	1,315,253

The following extracts, relating to British canals, are taken from Special Consular Reports "Canals and Irrigation" (pp. 169–251), published by the Department of State in 1891, to which the reader is referred for detailed information, the republication of which would swell this volume beyond reasonable proportions:

EARLY ENGLISH CANALS.

Traces of legislation with a view to facilitating communication by means of waterways are discoverable in England as far back as the reign of Henry I; who, in the year 1121, is supposed to have caused the Fossdike Canal (called an ancient Roman work) to be scoured out "for the purpose of opening a navigable communication between the Trent and the Witham at the city of Lincoln, so that that place, which was

then in a very flourishing state and enjoying an extensive foreign trade, might reap all the advantages of a more ready communication with the interior."

This was in 1121. Time's irony could scarcely be more keenly marked. The foreign trade of Lincoln is no longer extensive. The city is chiefly known to-day, and to the outside world, for its relics of the past, its magnificent cathedral and other heirlooms of departed greatness; but the Fossdike is there still. It is about 11 miles long and level through its course. Despite its old age, it gives no evidence of senility, but bears the barges which bring to the good citizens of Lincoln their coals with a surface as serene and equable as when, in the days of Edward the Confessor, the King's monnetari at Nottingham had the care of the River Trent and of the Fossdike and of the navigation therein.

One of the earliest of the English canals was also in that district, the Caerdyke, cut by the Romans to connect the River Nene from a point near Peterboro, in Northamptonshire, with the River Witham, 3 miles below Lincoln. This work was some 40 miles in length. It has been disused for centuries.

The Fossdike would appear to have been a prolongation of the Caerdyke, and the combination suggests perhaps as vividly as any the mode of origin and development of the canal system in this island.

The first canal seems merely to have been for supplements to the already existing water courses. They were not independent works intended to supply a separate method of transportation.

As the Caerdyke led from the River Nene near Peterboro to the Witham, below Lincoln, and the Witham was joined by the Fossdike to the Trent at Torksey, whence the Trent empties into the Humber, one of whose affluents is the Ouse, this apparently trifling length of 11 miles of the Fossdike navigation was or might have been the completing link in an inland course from Northamptonshire to York, which was the capital of Roman Britain. It remained for a much later date for the chain to be taken up and borne by the Aire and the Calder from the Ouse to Leeds and Wakefield, and thence by other canals across the Pennine Hills to Manchester, Liverpool, and the Irish Sea.

During the twelfth and the succeeding centuries up to the sixteenth, little attention was apparently paid to the opening of new channels of traffic by water, and, indeed, until the eighteenth century no widespread endeavor manifests itself to add to the natural routes supplied by the various creeks and rivers.

LEEDS DISTRICT CANALS.

The lord mayor and the aldermen of York were appointed in 1462 conservators of the Ouse and other rivers connected therewith. During the five decades, 1828 to 1868, the traffic averaged about 110,000 tons per annum. The navigation in 1872 extended from 8 miles above York to the confluence of the Trent, Ouse, and Humber—60 miles.

The Aire and Calder was incorporated in 1699, and subsequent acts of Parliament were procured in 1774, 1820, and 1828. In point of construction and operation, this has been regarded up to the present time as the model canal in England.

Up to 1872, there had been expended on this work more than £2,000,000 ($9,733,000), out of which, borrowed and then due, there remained about £500,000 ($2,433,250). Interest was paid on this sum before declaring dividends. The amount of share capital and debt is not limited by the acts of incorporation. Proprietors' interests are said to be estimated by the proportion borne to dividend. In 1872 it was stated that the Aire and Calder dividend had ranged up to that time from £40,000 ($194,660) to £72,000 ($350,388).

In 1872, reconstruction of the canal for the fourth time was taking place.

The canal was originally made 3 feet 6 inches in depth, and the locks were 60 feet by 15 feet by 3 feet 6 inches. Under the act of 1774 the locks were made 66 feet by 15 feet by 5 feet throughout the system. In 1820 the Goole Canal was constructed, with locks 72 feet by 18 feet by 7 feet and, under the act of 1828 these dimensions were extended to the whole navigation. Since the year 1860 a general improvement had taken place previously to 1883, with locks 215 feet by 22 feet by 9 feet. At that date (1883) these changes lacked about three years' work of being complete as to the routes from Goole to Leeds and from Goole to Wakefield. The canal itself was then 66 feet wide. From 1860 to 1883 £600,000 ($2,919,900) was said to have been expended in improvements and purchases of mill power and water rights, etc.; of this amount £100,000 ($486,650) was spent on the port of Goole and £32,000 ($155,728) in purchasing the Bradford Canal.

A summary given in 1883 makes the distances as follows:

Goole to Wakefield, 37 miles; Goole to Leeds, 36 miles; Barnsley branch, 12 miles (acquired in 1871); Bank Dole branch, 11 miles (Bank Dole, 18 miles from Goole to Selby).

Navigation of the River Aire to Rawcliffe and intermediate points not touched by the canal was also in the hands of the Aire and Calder; so that the total length of the undertaking, reckoning canal and river together, was about 80 miles.

Over the Aire and Calder proper, not including the Barnsley Canal, the traffic in 1872 amounted to about 2,000,000 tons, total; equivalent to 42,250,000 tons carried 1 mile. At the same period the rate of the Barnsley was about 250,000 tons per annum, and that of the Calder and Hebble 556,000 tons.

The gross tonnage of the Aire and Calder is given as follows: In 1838, 1,383,971 tons;1848, 1,335,783 tons; 1858, 1,098,149 tons; 1868, 1,747,251 tons.

The locks of the Aire and Calder are divided; one length takes two boats and the other length takes one boat, so as to save the water.

Three boats of the Leeds and Liverpool Canal will go through the Aire and Calder locks at once.

A large culvert extends alongside the lock, with one sluice at the upper end of the lock 7 by 5 feet (the ordinary sluice is 2 or 3 feet square), and at the lower extremity of the lock is another sluice. When that is closed and the lock is empty the upper sluice is raised. It is self-balanced, like a throttle valve. Three orifices open into the elongated lock, arranged so as to divide the boats and prevent their knocking together when they are in the lock. To empty the lock the upper sluice is closed, the lower one opened, and the water drawn into the culvert and discharged at the lower end. This plan is used instead of discharging the water at the gate. The sluices are practically self-acting; two turns of the sluice handle raise it and three turns lower it. The lock is said to be filled and emptied with much more celerity by this plan than in the ordinary way, by the gates.

By way of the Aire and Calder, there are three routes from Hull and Goole to Liverpool, viz: (1) Through Leeds, by Aire and Calder, Leeds and Liverpool; (2) through Wakefield, by Aire and Calder, Calder and Ribble, Rochdale, Bridgewater, Mersey River; (3) through Wakefield, by Aire and Calder, Calder and Hebble, Sir John Ramsdin's, Huddersfield, Ashton, Rochdale, Bridgewater, Mersey River

The distances are given as follows:

Route.	Miles.	Route.	Miles.
No. 1.		*No. 3.*	
Hull to Goole	26	Hull to Wakefield	63
Goole to Leeds	36	Wakefield to Cooper Bridge	13
Leeds to Liverpool	128	Cooper Bridge to Ashton	24
		Ashton to Rochdale Canal at Manchester.	4½
Total	190	Manchester to Liverpool	42
No. 2.		Total	146½
Hull to Goole	26		
Goole to Wakefield	37		
Wakefield to Sowerby Bridge	22		
Sowerby Bridge to Manchester	33		
Manchester to Runcorn	27		
Runcorn to Liverpool	15		
Total	160		

The Barnsley branch was purchased by the Aire and Calder in 1871. The fifteen locks on this branch were subsequently lengthened from 66 feet, their length in 1871, to 85 feet, increasing the viable tonnage from 75 to 115. This took two years and cost about £7,500 ($36,498.75), somewhat over £500 ($2,433.25) per lock. It made the locks of the Barnsley Canal in 1883, 85 by 15 by 6 feet. The Silkstone extension on this branch is now (1890) used merely for water supply, and is without traffic; it is 2 miles in length. It had formerly a large coal traffic on it.

The branch of the Aire and Calder from Bank Dale to Selby distributed to York, Tadcaster, and Malton, with considerable trade in 1883, which still continues.

The old line through Haddlesey and Snaith to the Ouse was in 1883 nearly disused on account of its circuitousness, and the locks remained at 5 feet, the depth of 1776. The new lines to Goole and to Selby had absorbed the traffic, leaving but a little in coal and timber to the old route. The good navigation through Whitley and Pollington is called the Knottingley and Goole Canal.

In 1883, vessels up to 167 tons burden were going on the line from Goole to Leeds or to Wakefield.

The principal tonnage in 1872 was coal, but they had also a large traffic in grain, stone, timber, dyewoods, and general goods.

There were two recognized systems of traffic on the Aire and Calder, the quick transit or merchandise system and the slow transit or mineral system. The company acted as carriers in addition to being takers of toll, and they do so still. I learn from the company that they convey in the capacity of carriers and by means of flyboats (hauled by steam so far as their own waters are concerned) large quantities of merchandise between the ports of Hull and Goole and Leeds, Bradford, Shipley, Bingley, Keighley, Skipton, Colne, Burnley, Accrington, Blackburn, Wigan, Liverpool, Waterfield, Dewsbury, Barnsley, Mirfield, Huddersfield, Brighouse, Halifax, and Sowerby Bridge. Through their agents, they say, they also carry to Rochdale, Todmorden, Littleboro, Heywood, Manchester, and other places. They say the rates of carriage charged by water are less than those of the competing railway companies.

The merchandise traffic of the Leeds and Liverpool Canal was leased to certain railway companies for twenty-one years expiring in 1874. On certain percentages of liability the railways paid so much a year for the merchandise traffic, leaving the mineral traffic and the maintenance of the canal with the canal company. Since the termination of the lease, according to Mr. Bartholomew's evidence in 1883, from which I derive these facts, through rates for the Aire and Calder and the Leeds and Liverpool had been arranged. A reasonable and fair increase of traffic, more than was due to the general increase of the traffic of the country, had resulted.

The Leeds and Liverpool Company themselves had become carriers since the lease expired, and had carried merchandise traffic themselves largely.

A recent newspaper report makes an estimate of the amount expended on the Leeds and Liverpool Canal from the commencement of the undertaking to the present date, that is to say, from 1770 to 1889, and reckons the total sum at £1,500,000 ($7,299,750), of which by far the greater part is deemed to have been contriouted from savings out of revenue.

LIVERPOOL DISTRICT CANALS.

The principal canals in this district are the Shropshire Union Canals, made up of several canals, as stated below; the Leeds and Liverpool Canal, and the Manchester Ship Canal, formerly the Bridgewater Canal.

Originally, they were built generally with sloping sides, but more recently the sides are perpendicular, and the towpath side is protected by a granite wall, the other side being simply earth, protected where necessary by piling.

The locks are chiefly of stone and brick, but latterly concrete is preferred for this. The lock gates are of elm, oak, or teak wood.

The Shropshire Union Canals afford the shortest and best canal route between the Mersey and the South Staffordshire and Birmingham iron districts, and the only water route between that river and Shropshire and North Wales, Cheshire, and Chester. They also join the North Stafford Canal at Middlewich, and thus provide water communication between the Shropshire Union system and North and South Staffordshire, and also Warrington and Manchester districts.

(1) Chester Canal, between the River Dee at Chester and Nantwich, a distance of 20 miles, the statutory authority for which was given in 1772.

(2) The Ellesmere Canal, from Carreghofa in Montgomeryshire, where it joins the Montgomeryshire Canal, to Hurleston in Cheshire, where it joins the Chester Canal, with a branch from the Dee at Chester to the River Mersey at Ellesmere Port. The distance traversed covers 86 miles. The act of Parliament was passed in 1793.

(3) The Birmingham and Liverpool Canal, from Autherly, a point of junction with the Stafford and Worcester Canal near Wolverhampton, to Nantwich, where it joins the Chester Canal, with a branch to the Shrewsbury Canal at Norbury Junction, the distance covered being 53 miles. Authority for construction was given in 1826.

(4) The Montgomeryshire Canals, from Correghofa (where the Ellesmere Canal begins) to Newtown in Montgomeryshire, with branches. The distance covered is 25 miles. The authority for this was given in 1794.

(5) The Shrewsbury Canal, from Wombridge to Shrewsbury in Shropshire, the distance covered being 22 miles, the authority for which was granted in 1793.

The whole of these canals were formed into the Shropshire Union Company in the year 1846.

The total length of the various canals forming the company's system is about 206 miles.

The canal from Nantwich to Ellesmere Port (its terminus), where it joins the River Mersey, is sufficient to pass lighters and flats carrying from 40 to 60 tons, and such craft are constantly employed upon it.

On other parts of the system narrow boats 7 feet wide are used, which carry from 18 to 30 tons, according to the depth of water. The depth of water varies from 3 feet to 4 feet 6 inches.

The locks on the canal from Chester up to Nantwich are broad, and admit two narrow boats at a time. On other lengths they are narrow.

In all districts, the width of the waterway is sufficient to admit of two narrow boats passing at the same time, except through the locks, tunnels, and aqueducts.

LONDON DISTRICT CANALS.

Regent's Canal.—By courtesy of Mr. E. Thomas, the engineer and manager of the Regent's Canal, I am informed that, under the authority of the British Parliament, the canal was commenced in the year 1812 and occupied about eight years in construction, being opened for traffic in the year 1820. It was constructed in the ordinary manner, but differs from other canals by having two locks at each variation of level, side by side, to economize consumption of water.

The Limehouse dock has a water area of 10 acres, and extensive quayage, with a ship entrance 350 feet long, 60 feet wide, and with sills laid 28 feet below Trinity high-water mark; also an entrance for barges 79 feet long, 14 feet 6 inches wide, with sills laid 22 feet below Trinity high-water mark.

The wharves and jetties in the dock are provided with hydraulic and other cranes for transshipping and loading coals and other goods up to 15 tons weight.

The dock, which is within and part of the port of London, is most conveniently situate on the north bank of the River Thames, about a half-mile below the Shadwell entrance to the London docks, 1½ miles below London Bridge, and one-third of a mile above the Limehouse entrance to the West India docks, and is close to the Stepney station of the London and Blackwall Railway, which is reached by trains from Fenchurch street station in eight minutes; and trains run to and from this station to all stations on the Great Eastern Railway, and the London, Tilbury and South End, Thames Haven and London, Woodford and Ongar branches thereof, and also in communication with the trains of the North London Railway Company passing Bow station.

Screw steam vessels to and from Liverpool, calling at Falmouth, Plymouth, and Southampton, leave and arrive at the dock weekly. London agents, J. D. Hewett & Co., 101 Leadenhall street, and John Allen & Co., 150 Leadenhall street.

The jetties in the dock are capable of transshipping and weighing with great rapidity and small breakage coal from screw steamers and other vessels into craft for the River Thames and other inland navigations. The Regent's Canal communicates with the dock and River Thames, and is navigable for barges of 100 tons burden. It passes through Stepney, Mile End, Bethnal Green, Hackney, Shoreditch, St. Luke's, Islington, St. Pancras, Marylebone, and Paddington, in which last-named parish it communicates with the Grand Junction Canal.

Large warehouse accommodation and extensive wharf area for storing timber, stone, and other goods are provided within the dock premises.

The company are permitted under a sufferance license (Class B), received from the honorable board of customs, to receive into the dock, and land upon the quays, or transship into craft for the river or canal, every description of goods and grain.

The facilities which are now afforded at this company's dock are strongly recommended to the notice of traders and lightermen on the Thames and the Regent's Canal, Hertford Union Canal, Grand Junction Canal, River Lee, and other inland navigations connected therewith, as considerable inconvenience, detention of vessels, and expense, also risk of damage to valuable cargoes, such as grain, etc., in barges, consequent upon navigating the River Thames, would be avoided by using the dock.

The Great Eastern, Great Northern, Midland, and London and Northwestern Railway Companies have their goods termini on the banks of this canal, and the Great Western Railway upon the Paddington Basin.

Grand Junction Canal.—This canal was constructed, under an act of Parliament, in the year 1873. The length of the main line and its branches is about 140 miles, and the carrying capacity of barges navigating the canal varies from 50 to 76 tons, according to the craft and section of canal navigated. This company has power to charge toll for distances of about 100 miles of 16s. 10¾d. per ton, but in point of fact the traffic will only bear a toll of 2s. 6d. a ton over that section, thus showing a large reduction that has now been effected on the expectant sources of revenue at the time of construction.

This canal, for 30 miles from the River Thames at Brentford, Middlesex, was partly constructed by canalizing the rivers Brent, Colne, Gade, and Bulbourne, and is not much used for irrigating purposes.

The Surrey Canal.—The canal belonging to this company was constructed in the year 1807. The canal is a short one—only 4 miles in length, being part of a scheme devised in the early part of this century for communication from Rotherhithe, which is about 1½ miles from London Bridge, to Battersea, which is about 3 miles from London Bridge, but the plan was not carried out in its entirety, and the canal terminates at Camberwell and Peckham, suburbs of London. The canal was constructed for the class of barges ordinarily navigating the river Thames, and is camp-sheeted for nearly its entire length, rendering the full width available.

The traffic consists entirely of barges engaged in supplying the wharves and premises on the banks of the canal with goods which enter the company's docks at Rotherhithe.

The premises on the canal are chiefly occupied as tar distilleries, chemical manufactories, and wood yards, and a large part of the revenue from the canal is derived from the dues on coals which are brought up the canal to the South Metropolitan Gas Company, whose works have a water frontage on the canal. The canal is virtually a part of this company's dock system.

Length of canal	miles..	4
Width at surface	feet..	58
Width at bottom	do...	52
Number of locks		1
Lift of locks	feet..	3½
Length of locks	do...	120
Average load	tons..	80
Maximum draft of boats	feet..	4¾
Maximum width of boats	do...	17¾

SHEFFIELD DISTRICT CANALS.

The Sheffield and Tinsley Canal, the Dun Navigation, the Stainforth and Keadby Canal, and the Dearn and Dove Canal were constructed about one hundred years ago, and there has been but little improvement in them since they became the property of the Manchester, Sheffield, and Lincolnshire Railway Company in the year 1849. The size of these canals is such as to limit boats and barges trading between Sheffield and the River Trent to a carrying capacity of about 80 tons each. The use of steam as a propelling power is prohibited, and the length of time required to pass between Sheffield and tide water averages about a week. The locks are small and numerous, and from the canal into the Trent only one boat can be passed through at a time, giving a total of only about twenty boats at each tide. In spite of this unfavorable condition, however, not less than 500,000 tons of through traffic pass the lock at Keadby in the course of a year.

The canals being in the possession of a railway company which reaches the same points between Sheffield and the coast, there is, consequently, no competition in rates or traffic between the two. Thus the railway company's rate on coal for shipment at Hull from South Yorkshire amounts to 2s. 10d. (69 cents) per ton, or double the rate charged by the Aire and Calder Canal over an equal distance from the West Yorkshire collieries to Goole.

THE MANCHESTER SHIP CANAL.[1]

This great enterprise—the cutting of a canal from tide water at Liverpool 35½ miles to Manchester, 172 feet wide, 26 feet deep, capable of permitting vessels of 6,000 tons to steam directly to this city—is so nearly completed that the opening for traffic is officially arranged for January 1, 1894.[2]

This canal has already cost some $75,000,000, $35,000,000 more than the original estimates, owing to unforeseen engineering difficulties, the deceptive nature of the soil, and other causes.

The total fall from the water level in Manchester docks to Liverpool is 60½ feet. For 14 miles out from Manchester the rivers Irwell and Mersey form the course of the canal; but many of the crooks and bends of these tortuous streams have been cut off, so that, with the exception

---

[1] Extract from report of Consul Grinnell, of Manchester, November 28, 1893, printed in Consular Reports for February, 1894.

[2] Since opened and in operation.

of a few gradual curves, the course for the whole length of the canal is due west to Liverpool. The width and depth are as follows:

	Feet.
Average width at the water level	172
Minimum width at the bottom	120
Minimum depth of water throughout	26

There are five large locks, five intermediate, and one small one, viz:

Location.	Dimensions of large locks.	Dimensions of intermediate locks.	Rise.
	Feet.	*Feet.*	*Feet.*
Eastham, tide water	600 by 80	350 by 50	.....
Latchford	600 by 65	350 by 45	16½
Irlam	600 by 65	350 by 45	16
Barton	600 by 65	350 by 45	15
Mode Wheel	600 by 65	350 by 45	13

The capital (I copy from a publication of June last) is thus set down:

Ordinary shares	$19,466,000
Preference shares	19,466,000
Loan received	27,252,400
Total	66,184,400

The borrowing powers are $9,733,000.

As regards the United States, the object of the undertaking is to induce exporters to ship cotton and food products direct to Manchester. The directors are responsible for these two statements: First, three-fourths of all cotton coming to the British Islands is manufactured in Manchester and vicinity; second, within a radius of 30 miles there are 7,500,000 mouths to feed.[1]

[1] *Finances of the canal.*—The following statistics were received from Consul Grinnell (Manchester, June 9, 1894), and published in Consular Reports for July, 1894, in reply to a Department instruction, prepared at the request of a Philadelphia city commission inquiring into a proposition for a ship canal:

I have to acknowledge the receipt of your instruction to report upon the operations of the Manchester Ship Canal since its opening, i. e., "statistics covering the commercial success or nonsuccess of the canal." On Saturday, June 9, 1894, figures were, for the first time, given out by Mr. J. K. Bythell, chairman of the traffic and rates committee of the ship canal.

The traffic on the ship canal for the five months ending May was as follows:

Merchandise in sea going vessels (211,915 tons)	£28,868 =	$140,472
Merchandise in barges (63,785 tons)	919 =	4,472
Ships' dues	395 =	1,922
Passengers (323,056)	3,469 =	16,880
Cattle (979)	50 =	243
Total	33,701 =	163,989

As regards working expenses, it may be said, broadly, that the revenue for the five months will more than cover (1) all the expenses connected with the traffic, including wages, salaries, and stores; (2) rates; and (3) a full proportion of head-office expenses during the same period. Maintenance is not included. Until the works are more complete, I take it that all outlay on works will be a charge against capital.

IRISH CANALS.

The canals and inland navigation enterprises in Ireland are of three classes, viz:

First. Those owned and operated by private companies or corporations. Under this head are the following: The Grand Canal, with a total length, including branches, of 165¾ miles; the Barrow Navigation, partly canal and partly river, 42 miles; the Upper Boyne, all river, 6 miles, completed in 1800; the Lagan, mostly river, 26 miles; the Newry, canal and river, 35 miles; the Suir, all river, 16 miles; the Royal Canal, 96 miles. These, of course, are maintained out of funds belonging to their respective companies. From their importance, the Grand Canal, the Royal Canal, the Barrow Navigation, and Lagan Navigation will be considered separately and in greater detail further on. The improvements upon the routes described by the Upper Boyne, the Newry, and the Suir were largely accomplished by means of assistance in the forms of loans of public money, or by grants from general or special taxes. Some of these loans have been paid and some remitted. There is no considerable traffic upon these canals now, and the profits derived therefrom are small.

Second. Those owned and operated by the Government and maintained out of imperial funds. This class is composed of the following lines: The Lower Boyne, canal and river, 19 miles; the Maigue, all river, 8 miles, improved in 1751; the Shannon, chiefly river, 158 miles; the Tyrone, all river, 4 miles; the Ulster Canal, 44 miles. The improvement or construction of these channels, as the case may be, was accomplished by direct grants of the public funds and advances realized from local assessment. The latest reports rendered by the commissioners, under whose management are these several lines of navigation, show that the total annual receipts amount to £6,584, and the annual disbursement for expenses for all purposes to £6,192. Thus it will be seen that the receipts derived from rents, tolls, etc., make them a trifle more than self-sustaining. Of the lines mentioned, the Shannon Navigation and the Ulster Canal are the most important. The improvement of the former involved an outlay of £683,312, and the construction of the latter about £170,000.

Third. Those under the direction of local trustees. This class includes the Ballymore and Ballyconnell, mostly canal, 37 miles; the Lower Bann, mostly river, 50 miles; the Upper Bann, all river, 21 miles, and Lough Corrib, mostly river, 23 miles. The improvement or construction of these lines, as described, was also accomplished by grants of public money and advances secured in local taxation, amounting in the aggregate to about £600,000. These public works covered a period from 1845 to 1859. The group, as given above, is also a little more than self-sustaining. With the exception of the first mentioned, the latest figures show that the total annual receipts are £3,261, and the total disbursements are £2,553. As stated, these works are managed by local trus-

tees, representing the property interests which are contiguous to the several lines. In case of a deficiency, the difference is made up by means of local taxation. In case of a surplus, the local taxation is less by that amount. The system of management is the same as that which applies to public highways.

Grand Canal.—This is the most important artificial waterway in Ireland. Its main line extends from Dublin westward to the Shannon River, and from thence westward to Ballinasloe, with branches to the Liffey, Robertstown, Blackwood reservoir, Monastereven, St. James Well, Athy, Mountmellick, Edenderry, and Kilbeggan. Its summit level is 279 feet above sea level, which point is 26 miles west of Dublin. The locks upon this canal are 60 feet in length, 13 feet in width, and have 5 feet lift. Although steam is used somewhat horses are used principally as the power for moving the boats. The traffic upon this canal amounts to 600,000 tons annually. The Grand Canal now earns for the shareholders £1 15s. on each £100 of the capital stock. The construction of the Grand Canal was commenced in 1753, and the main line was completed in about 1800. The line west of the Shannon River and the branches were opened in 1830. The entire work involved an outlay of £2,000,000. A considerable portion of this amount was made up by grants from special or general taxes and also by loans, a part of which has been repaid to the Government, and a part of which has been remitted. The present capitalization of the company is £165,000.

Royal Canal.—The Royal Canal proceeds northwesterly from Dublin to Cloondara, on the Shannon, with a branch to Longford; the total length of channel being 96 miles. Its summit level is 324 feet above sea level. It is fed from Lough Owel, near Mullingar. The dimensions of the locks are 70 feet in length, 13 feet in width, with 5 feet lift. The Royal Canal Company was organized in 1784. The first 46 miles of the channel was completed in 1813. The remainder of the work was completed in 1822. It received large assistance from the Irish Parliament, and from the Union after that was established. The total cost of the work was something over £1,900,000. In 1813 the original company became insolvent, the charter was forfeited, and the property transferred to the directors-general of inland navigation. Again, in 1845, the Royal Canal was transferred to the Midland Great Western Railway Company, the consideration being £298,050. An essential condition of the transfer was that the purchaser should maintain the navigation and not vary the tolls except with the assent of the lord lieutenant of Ireland. Being its own competitor, however, the company does not utilize the facilities of the canal to any considerable extent. The annual tonnage amounts to only 86,500, on an average.

Barrow Navigation.—This route connects the Athy branch of the Grand Canal with the tidal part of the River Barrow, below St. Mullins, and affords water communication to Carlow, Leighlin Bridge, Bagnalstown, Goresbridge, and Graignamanna, and thence by tidal part of the

Barrow to New Ross and Waterford. The work was commeneed in 1759, and up to 1790 cost £80,769, about one-half of which was derived from public sources. It also received other grants after the Union, but the exact amount is not available. There is considerable traffic upon this route, but I have been unable to get figures showing annual tonnage; the profits to the shareholders are moderate.

Lagan Canal.—This is owned by the Lagan Navigation Company. The works were commenced by the commissioners of navigation for Ireland, the expense being defrayed by a local toll on beer, ale, and spirits imposed by an act of 1753.

In 1771, prosecution of work was delegated to local commissioners, who raised money on the securities of the tolls. Afterwards these creditors were constituted a company by act of Parliament. The canal extends from Belfast to Lough Neagh, 26 miles, and has twenty-six locks capable of passing lighters 62 feet by 14 feet 6 inches, with a maximum draft of 5 feet 6 inches.

The traffic is about 156,000 tons per annum, consisting of coal, Indian corn, timber, slates, bricks, etc., and return cargoes from Lough Neagh of sand for building purposes.

The company is managed by a Belfast board of directors, with secretary and manager of works.

The company are not carriers. The lighters trading are owned by different individuals. Wherever the canal touches, railway rates are brought down to canal rates. Roughly, the effect in cheapening transportation would probably be about from 15 to 25 per cent, or perhaps even more.

Ulster Canal.—The works on this canal were commenced by the Ulster Canal Company under an act of 1826. Loans to the extent of £130,000 were made by the commissioners of public works in Ireland. In 1865 the canal was transferred to the commissioners in discharge of the debt. More money was expended on the canal, but under the commissioners it has been kept in such want of repair and want of water that there could be no traffic. By an act of Parliament, passed in 1888, it was transferred to the Lagan Navigation Company as a gift, with £3,500 toward cost of repairs, the company being obligated to keep it in order for the public, charging fees regulated by act of Parliament. It is now being put in order. The canal extends from Lough Neagh to Lough Erne; 44 miles, and has twenty-six locks capable of passing lighters 65 feet by 11 feet, with a maximum draft of 5 feet when in repair.

Coal Island Canal.—Commenced in 1732 by the commissioners of Ireland, its navigation continued in their charge until 1787, when the works were transferred to parties undertaking to complete and extend the canal. In 1800, the navigation came into the hands of the directors-general of Ireland, and between 1800 and 1831 the sum of £26,240 was expended upon the works. In 1831, on the abolition of the directors-general of Ireland navigation, the management was transferred to the

commissioners of public works, in whose charge it has since continued, and a sum of £5,177 has been expended by them.

Under an act of 1888, it was transferred as a gift to the Lagan Navigation Company, with obligation to keep it in order for the public, charging tolls regulated by act of Parliament. The canal extends from the Blackwater River, which runs into Lough Neagh, to the town of Coal Island; 4½ miles, and has seven locks capable of passing lighters 62 feet by 14 feet 6 inches, with a maximum draft of 4 feet 9 inches. Traffic, about 15,000 tons per annum.

SCOTCH CANALS.

The only system of inland navigation within the limits of the consular district of Leith (Edinburgh) is the Union Canal, an artificial waterway, extending from Port Hopetown, in the western suburbs of the city of Edinburgh, to a junction with the Forth and Clyde Canal at Port Downie (a large basin at Lock 16), adjoining the town of Falkirk, in the county of Stirling.

The construction of the Union Canal was undertaken in the year 1817. It was opened in 1822, but as a property it proved a great failure. The returns from all departments—passengers, parcels, and miscellaneous goods, coals, stone, and other minerals, manure, etc.—proved much less than had been anticipated. The real returns during the seven years after opening did not amount to $85,000 a year, while the estimated returns had been set down at $275,000 a year. The canal was not intended for ship transit, but solely as a waterway of inland navigation for passenger traffic and merchandise between places on its own banks, and chiefly between Edinburgh and Glasgow, and therefore it was for a long period generally called the Edinburgh and Glasgow Canal.

The company owning it worked their business with great spirit, and adopted every available means in the endeavor to make their enterprise a paying one, or even to raise it to a fairly hopeful condition; but when the Edinburgh and Glasgow Railway was opened, February 18, 1842, it was seen that the canal could not long survive as an independent system of passenger and goods traffic between the two cities. A brisk competition was maintained for some time with little success, and ultimately, in 1849, the Union Canal was amalgamated with the Edinburgh and Glasgow Railway, both of which undertakings in 1865 passed into the hands of the North British Railway Company. The Union Canal, therefore, although still remaining as a work, is quite absorbed as a business in the interests of the railway.

The total length of the Union Canal, from Port Hopetown, at Edinburgh, to the junction with the Forth and Clyde Canal at Lock 16, is 31½ miles.

The medium width at top of bank is 40 feet; at surface of water, 37 feet, and width of water at bottom of canal, 20 feet. The depth of water is 5 feet.

There are eleven locks, 12½ feet wide. Depth of water on sill of locks, 5 feet 9 inches. Total rise or fall of locks, 10 feet 3 inches.

The traffic consists entirely in conveyance of coals, stone, bricks, and other minerals, and manure.

The present owners are merely toll takers, not carriers. Other people put on the barges or boats. The management of this canal is entirely in the hands of the North British Railroad Company.

The Forth and Clyde Canal.—The Union Canal at its western extremity terminates in the Forth and Clyde Canal, an artificial navigable line of communication between the Firth of Forth and the Firth of Clyde.

From the Forth, at the port of Grangemouth, the navigation into the canal runs about a mile up the River Carron from low-water mark in the firth to the first lock, where there are extensive harbor accommodations. Passing southwesterly through Grahamstown and the Carron Iron Works, the canal proceeds to Camelon and reaches Lock 16, where it attains an elevation of 128 feet above the level of tide mark at Grangemouth. At Lock 16, is the large basin called Port Downie, from which the canal sends off on its east side the Union Canal Navigation to Edinburgh, above mentioned. At Windford Lock, near Castlecary, it attains its highest elevation, and continues to preserve the same onward past Port Dundas at Glasgow, on the one hand, to the junction of the Monkland Canal, and onward on the other till near the aqueduct across Kelvin water. Thence it continues to the western terminus in the River Clyde at Bowling Bay, near the village of Bowling in Dumbartonshire, on the road from Dumbarton to Glasgow.

The work of excavation was begun in the year 1768, but, on account of unforeseen difficulties, by reason of inexperience of its projectors in such schemes, the canal was not completed till 1790.

The Forth and Clyde Canal was incorporated with the Monkland Canal in the year 1846.

The extent of the Forth and Clyde Canal in all its parts is 38¾ miles. The navigation direct from the Forth to the Clyde is 35 miles; the side branch to Port Dundas, 2¾ miles; the continuation to Monkland Canal, 1 mile.

The number of locks on the eastern part of the canal is twenty, and on the western nineteen, the difference being occasioned by the higher level of water in the Clyde at Bowling Bay than in Grangeburn or the Carron at Grangemouth. Each lock is 74 feet long and 20 feet broad, and procures a rise of 8 feet.

The locks admit vessels of 68 feet keel, 19 feet beam, and 8½ feet draft of water.

The greatest altitude of the canal is 156 feet; its medium breadth at the surface, 56 feet, and its medium breadth at bottom, 27 feet.

The canal is crossed by thirty-three drawbridges, and passes over ten large aqueducts, and thirty small ones or tunnels.

The tonnage dues imposed were, from sea to sea, 5s. 10d. ($1.41); from Grangemouth to Port Dundas, 3s. 10d. (93 cents); from Bowling Bay to Port Dundas, 2s. (48 cents). Subsequently tonnage dues were greatly reduced, making the rate not more than 1½d. (or 3 cents) per mile, but they continued to be remunerative.

In the year 1867 the two canals passed into the possession of the Caledonian Railway Company, and that company has ever since had the entire management of both of those systems of navigation.

The Monkland Canal.—This is an artificial navigable communication between the city of Glasgow and the district of Monkland, in the county of Lanark. Commencing in the northern suburbs of Glasgow, at Port Dundas, where it is brought into junction with the Glasgow branch of the Forth and Clyde Canal, it proceeds east-southeastward through the parish of Old Monkland to the River North Calder. The canal sends off four branches, one about a mile in length to Calder Iron Works, near Airdrie, in the parish of New Monkland, one about a mile in length to Gartsherrie Iron Works, one about a quarter of a mile in length to Dundyvan Iron Works, and one also about a quarter of a mile in length to Langloan Iron Works, all in the parish of Old Monkland.

The canal originally was projected as a measure for securing to the inhabitants of Glasgow a constant and plentiful supply of coal. The corporation of the city adopted the project, and having employed the celebrated James Watt to make surveys of the ground, obtained an act of Parliament for carrying out the design, and subscribed to a number of shares of the stock.

The width of the Monkland Canal at top is 35 feet, and at bottom 24 feet. Upon the lock sills the depth of water is 5½ feet.

By reason of the advantage possessed of easy communication with both the eastern and western seas, and because of its unlimited command of coal, the vicinity of the Monkland Canal has always been reckoned favorable for the establishment of manufactures, such as iron works and others of a like nature.

The Caledonian Canal.—This is a navigable line of communication through the Great Glen of Scotland, which extends across the country directly southwest from the Moray Frith, between the mouth of the River Findhorn and two bold promontories called the Sutors of Cromarty, onward to the island of Lismore, dividing the county of Inverness and the Highlands generally into two nearly equal parts, while it connects the German Ocean and the Atlantic at those points.

The northeast end of the canal is occupied by about 23 miles of the narrow or upper portion of the Moray Frith; the southeast end is occupied to the extent of 32 miles by the sea lochs Loch Eil and Loch Linnhe, and the intermediate portion has a total length of 60½ miles, of which 37½ consist of the four natural sheets of water named Loch Dochfour, Loch Ness, Loch Oich, and Loch Lochy. This intermediate

portion is the region of the Caledonian Canal, which comprises works at its extremities and 23 miles of dry cutting.

It appears that, by reason of the decay which has been rapidly going on in many parts of the original structure, much of it has to be renewed and otherwise improved. In response to an application for assistance the Government of Great Britain has sanctioned the sum of £5,000 ($24,332.50) as a contribution toward liquidating debt already incurred by the commissioners of the Caledonian Canal, and it is hoped that Parliament will approve of further annual sums being devoted toward the renewal of the original structure, as suggested in the report made by the superintendent.

The Crinan Canal.—This is a work at the north end of the peninsula of Cantire (otherwise Kintyre), in the county of Argyle, intended to afford a waterway between Loch Gilp and the Atlantic Ocean in order to avoid the difficult and circuitous passage of 70 miles around the Mull of Cantire. The Crinan Canal is about 9 miles long and contains fifteen locks, thirteen of which are 96 feet long, 24 feet wide, and 12 feet deep, and two locks are 108 feet long and 27 feet wide. Eight of the locks occur in the extent from Loch Gilp or Ardrishaig at the east end and seven in descending to Crinan at the west end. The canal is chiefly used by small coasting and fishing vessels and by the steamboats which ply between Inverness and the Clyde. It is navigable by vessels of 200 tons burden. The small passage steamers do the distance from one terminus to the other, including the locks, in about two hours.

It is expected that the Isthmus of Cantire at no distant date will be cut off from the mainland by the formation of a ship canal connecting East and West Lochs Tarbert. The cost of such an undertaking has been estimated at £140,000 ($681,310).

From the foregoing description of the various lines of inland navigation at present in use in Scotland it will be noted that the three first mentioned, namely, the Union, the Forth and Clyde, and the Monkland, are all connected and worked as one system of water carriage managed and controlled entirely by railway companies.

The Caledonian Canal and the Crinan are each quite independent of railways, but both are controlled and subsidized by the Government of Great Britain.

Therefore, in the first instance there is no competition as to rate of cargo and the latter independent systems have no competing lines of transit.

There are no irrigating canals in Scotland.

Proposed ship canal.—There is a large ship canal now under consideration, a matter probably not of the near future but likely to be ultimately accomplished, which points to a waterway for large ships and steamers from the Firth of Forth to the Clyde. There are two routes recommended: One involving deep cutting, joining the Forth and Clyde with tide water, estimated to cost $60,000,000; the other by locks joining

the Forth with Loch Lomond and Loch Long, thus making an outlet to the Atlantic a few miles west of Glasgow. The estimated cost of this route is about $38,000,000. At a recent meeting of the promoters of this proposed canal from the North Sea to the Atlantic the latter route seemed the most feasible and received the weight of commendation.

One object to be attained by this canal is the quick and easy transportation of warships from one side of Scotland to the other, and is, therefore, related to the subject of coast defense. It is also claimed that much of the shipping from northern Europe, notably Hamburg, Antwerp, etc., would choose this route to the west, thus avoiding the boisterous English Channel and the still stormier route in certain seasons via the north of Scotland. It would also furnish Edinburgh, at the port of Leith, a direct shipping communication to the United States without reshipment at Glasgow.

It is sufficient, however, at present to say that the matter is still a project, and has not yet obtained even the uncertain recognition of probability.

BRITISH HIGHWAYS.[1]

It is impossible in a report like this to present a survey of the highways of Great Britain, or to give a detailed statement of the method of their construction.

Construction.—Many of them were designed and built by the Romans, and, as far as I can learn, nearly all of the existing national roads were designed and constructed before the commencement of the present century.

The systems on which these roads were constructed all involved the preparation of the ground, according to the character of the soil on which the road was built. Pounding the soil to make it firm, driving in piles, or laying on planks or logs crosswise if the soil was boggy, or sometimes placing large rocks, were the usual way of preparing the substratum. This being done, a bed of concrete from 6 to 10 inches thick or large blocks of stone were carefully and compactly laid to form what was called the subroad, over which was placed the road proper, which was composed of either prepared slabs or blocks of stone, broken stone, or gravel and sand.

About a century ago, John Loudan Macadam inaugurated a new system of road making and repairing, to explain which I can do no better than insert here an article, which I find is taken from the evidence of Macadam before a committee of Parliament in 1889:

> Macadam's plan of road making differed as much from the old way which he found in operation as a bridge does from a ford. Instead of going deep for a "bottoming," he worked solely on the top. Instead of producing a peaked, roof-like mass of rough, soft rubbish, he got a flat, smooth, and solid surface. In lieu of a road 4½ feet through, he made one of at most 10 inches in thickness; and for rocks and

[1] From Special Consular Reports "Streets and Highways."

bowlders he substituted stone broken small. His leading principle was that a road ought to be considered as an artificial flooring, so strong and even as to let the heaviest vehicle pass over it without impediment. Then people began to hear with wonder of roads 30 and 40 feet wide rising only 3 inches in the center, and he propounded the extraordinary heresy that a better and more lasting road could be made over the naked surface of a morass than over solid rock. Another of his easy first principles was that the native soil was more resistant when dry than when wet, and that, as in reality it had to carry not alone the traffic but the road also, it ought to be kept in a condition of the greatest resistance; that the best way of keeping it dry was to put over it a covering impervious to rain—the road, in fact; and that the thickness of this covering was to be regulated solely in its relation to its imperviousness, and not at all as to its bearing of weights, to which the native soil was quite equal. Instead of digging a trench, therefore, to do away with the surface of the native soil, he carefully respected it, and raised the road sufficiently above it to let the water run off. Impermeability he obtained by the practical discovery that stones broken small and shaken and pressed together, as by the traffic on a road, rapidly settled down face to face and angle with angle, and made as close a mass as a wall. Mankind now believe that this last is all that Macadam invented; the rest is forgotten. That important fraction of his discoveries is what has given to us the verb to macadamize ("to pave a road with a small broken stones."—Skeat).

Tollgates.—The roads in England were until recently under the control and management of certain bodies called turnpike trusts or trustees, who were usually appointed by acts of Parliament applying to separate and distinct districts. Under these acts the turnpike trustees were authorized to collect from the drivers of all vehicles or from persons traveling on horseback small sums which were called tolls. These tolls were collected in the highroads at various points at a tollhouse, being a small two-roomed cottage erected close up to the road, where a tollgate was fixed. This gate was a five-barred gate which was kept locked, and opened for each passenger on payment of the toll.

These tollhouses would in some districts be from 4 to 5 miles apart, and in others would be within much shorter distances, as the traveler happened to get on the roads governed by different trustees. These tolls were, for a two-wheeled vehicle, generally about 6 cents each, and for a horseman 2 cents or 3 cents. Each person paying the toll received a small ticket marking the toll, and the toll paid in some instances freeing the passenger for a gate farther on the road. In some districts tolls were very much higher than in others.

These turnpike trusts were done away with by an act of Parliament passed in 1878, known as the highways amendment act (41 and 42 Vict., c. 77), after which the old tollhouses gradually disappeared.

HIGHWAYS IN THE LIVERPOOL DISTRICT.

I am informed that some of the country roads in the vicinity of Liverpool have only the natural foundation, which means no foundation at all, are poorly drained, and have been much neglected, but are now being more carefully treated. Such roads, however, are rarely seen, and in the main the roads are thoroughly made and maintained in good condition. There is but little of the common "dirt road," and this is

made here as everywhere else of the material nearest at hand, the expense being entirely for labor. In the vicinity of works and mines where the traffic is heavy, more care is taken, and granite is brought by rail for repairing. Where the traffic is lighter, the local stone, whatever it may be, is used. In some localities, slag and other refuse from works and mines are largely used for country roads and for streets in towns. Such cheap roads being the exception, it is difficult here, where macadam is almost universally adopted, to draw the line between city streets and country roads.

In Carnarvonshire, Wales, the best roads have a hand-set pavement for a foundation (the ground first of all being well drained), covered with about 6 inches of "metaling" (stone) broken to a 2-inch gauge.

In the Wavertree district, near Liverpool, macadamized roads are preferred.

HIGHWAYS IN THE ENGLISH MIDDLE COUNTIES.

The beautiful country roads now in use, for which these middle counties of England are so worthily famous, were, with the exception of the few roads built since 1878, made by the turnpike trusts under special acts of Parliament, the first of which was passed in 1762. The different districts of the country, having been divided into sections or divisions, each several section was placed in the hands of trustees, separate and distinct acts of Parliament being required for each of said sections. These trustees levied tolls on all traffic passing over the roads under their control; the amount of toll demanded, per horse, cart, wagon, etc., varied from time to time, according to the distance traveled between the toll gates and the amount expended in building and maintaining the roads. In some instances the trustees, finding the revenue from their roads inadequate to meet the outlay, delegated, or contracted out, to private individuals, the collection of the tolls. These individuals, having guaranteed the necessary amount to the trustees and depending for their reimbursement on the tolls, looked very sharply after the just and full collection of the same.

Under these trusts many of the old lanes and wagon tracks, by the proper use and periodic application of hard broken stones (obtained from the adjoining counties) to the ruts and holes caused by continued travel, have attained a condition equal to the highways running through the country. To the good judgment and judicious care of these trusts is due the present almost perfect condition of the main or country roads of England. Many years, however, of untiring labor have been required to accomplish such results.

These trusts, however, were abolished in this (Tunstal) district about the year 1878. From that date to the year 1888 the roads were under the control of, and maintenance of the same devolved upon, the local authorities.

HIGHWAYS IN SCOTLAND.

The country road system of Scotland may be regarded as a growth to meet the wants of the public and as a result of experience in carefully providing for the public needs, by studying the best methods, its present state of excellence, approaching perfection, not having always existed, though for scores of years Scotland, even in the Highlands, has been famous for her good roads.

A hundred years ago, the population in some districts was already becoming quite dense, and the need of good roads and how to build them naturally commanded the attention of the public and officials. Sixty years ago, and before the country was interwoven with a network of railways and when traffic and travel were already considerable on the great stage routes to London, as well as to other leading centers, good roads were more than a luxury; they became a necessity, and required to be perfected and kept up at any cost. What wonder, then, that the roads now are in excellent condition everywhere.

Comparatively few roads are now being built, because not needed, but the old ones are constantly being improved by cutting down high grades, filling in the low places, renewing the top dressing, etc.

A considerable force of men is kept constantly employed improving and repairing the roads, the counties or shires, for road purposes, being divided into divisions, these being subdivided into districts, the latter embracing from 15 to 30 or more miles of road. The districts are in turn subdivided into sections, upon which squads of men, from three to six in number, according to the needs of the road, are kept at work the year round.

A heavy steam roller, 10 to 15 tons, plays an important part in road repairing as well as road making, and though of comparatively recent introduction is now regarded as essential, the larger, or 15-ton roller, being considered the better and more economical. One roller, with its complement of men, does its part of the work upon several of the above-described sections.

Macadamized roads.—Macadamization, or the process of covering roads with broken stone, came into use in Scotland early in the present century. Excellent roads were formed by placing in a suitably prepared road layers of broken granite or other hard stone, which became hardened into a solid mass by the traffic passing over them.

Midlothian roads.—Edinburghshire, or, as otherwise named, the county of Midlothian, occupies an area of 358 square miles, or 229,120 acres. This area, in the management of its roads, is divided into four districts, namely, the Edinburgh suburban, the Lasswade, the Calder, and the Galawater districts, each having its board of road trustees, under whose care the roads in the respective districts are maintained and who control the expenditure required upon them.

In the county, there have been two methods used in making and maintaining its roads or highways, viz, those of Telford and of Macadam. Briefly stated, the Telford system consisted of a bottoming of large wedge-shaped stones set on end, sharp edges uppermost, with a covering of broken "metal" (stones) on the top. That of Macadam consists of a bed of metal broken to a uniform size from top to bottom. The latter system has been adopted throughout the county of Edinburgh for many years past, and on account of its giving a smoother surface to the road is considered preferable to the Telford system. It is preferred also as avoiding the risk of the large bottoming stones used in the Telford system working up to the top, which, it is said, happens in nearly all roads having pitched or paved foundations. The first cost of macadamizing a road is usually from 60 cents to 70 cents per superficial square yard.

The main lines of roadway throughout the county of Edinburgh are from 25 to 30 feet wide from fence to fence, the greater width being required for roads of much traffic or near the city; and under the roads and bridges act of the year 1878 it is ordained that no erection shall be built more than 7 feet high within 25 feet of the center of the roadway. The old parish roads in the county, however, are often not more than 15 feet wide, but these are frequently being made wider where greater traffic or other circumstances require the improvement. The roadways are maintained with whinstone procured in the neighborhood, broken to a uniform size of $2\frac{1}{4}$ inches, and applied according to the amount of traffic.

HIGHWAYS IN IRELAND.

The materials employed for the construction and maintenance of roads in this country are broken stones and gravel—chiefly depending upon whether the roads are in a stone or gravel district. For roads subject to heavy traffic, broken stone metaling is essential, laid on a pavement of stones set on edge closely together, the top interstices being filled with "spawls," so as to provide a firm foundation for the metaling. Round stones, such as are found in coarse gravel, should not be used, as they invariably yield to lateral pressure; therefore bottoming should be done with quarry stones or natural bowlders broken to a suitable size, so that the natural rounded surfaces are not in contact with the pavement. The strength of the road crust must be determined by the engineer according to the nature and amount of the traffic to be provided for.

The steam roller for the consolidation of the metaling of newly-coated roads is a recent economic improvement. The road metaling is consolidated at once, a smooth, firm surface is provided, and the broken stones are pressed in their original angular condition.

BRITISH OCEAN LINES.

The Department having failed to receive any reports from Liverpool, London, or Southampton, the following information concerning ocean lines sailing from those ports is taken from the London Shipping Gazette and Lloyd's List, and the Glasgow Herald:

LIVERPOOL.

American Line.—United States mail steamers; Liverpool to Philadelphia, weekly. See this line under Southampton for further particulars.

Bibby Line.—For Rangoon and Colombo, via Marseilles. Takes goods at through freight for Indian coast ports, transshipments at Colombo, and for Burmese ports, transshipments at Rangoon. First-class vessels and accommodations. Head office (Bibby Bros.), 26 Chapel street, Liverpool.

White Star Line.—For New York, San Francisco, and Australia. The steamships of this line are represented as first class both for passengers and freight. Ismay, Imbrie & Co., agents, 10 Water street, Liverpool.

Atlas Line.—For West Indies, Colombia, and Costa Rica. The mail steamers of this line also sail from New York to Colombia and Costa Rica weekly, and from New York to Haiti fortnightly. Leech, Harrison, & Forwood, agents, Liverpool.

McIvor & Nelson Line.—For Montevideo, Buenos Ayres, and Rosario For freight or passage apply to David McIvor & Co., Liverpool.

Booth Line.—The steamers of this line sail from Liverpool to Para, Manaos, Maranham, and Ceara. For freight and passage apply to Alfred Booth & Co., 14 Castle street, Liverpool.

Macandrew Line.—To Spain from Liverpool, London, and Glasgow. Regular line of screw steamers to all ports in Spain. For freight and passage, apply to the agents, Robert Macandrew & Co., Suffolk House, Laurence Pountney Hill, London, E. C.; Macandrew & Co., 5 Chapel street, Liverpool; or to J. & A. Roxburgh, 3 Royal Exchange Square, Glasgow.

Swedish Line.—Liverpool to Gothenburg. Regular line of Swedish steamers, taking goods at through rates to Halmstad, Helsingborg, Landskrona, Malmo, Ystad, Carlshamn, Carlskrona, Calmar, Norrkoping, and Stockholm. For freight or passage, apply to Messrs. Tegner, Price & Co., 107 Fenchurch street, London, E. C., or to Bahr, Behrend & Ross, Old Castle Buildings, Preeson's row, Liverpool, and at 75 Piccadilly, Manchester.

McIlwraith, McEacharn & Co., Limited.—To Australasia, Africa, and America; Adelaide, Sydney, Melbourne, Newcastle, Wellington, Dunedin, Wellington, Auckland, and Lyttleton; Mauritius; Victoria, Vancouver City, and Seattle. For freight or passage, apply to Gracie, Beazley & Co., 25 Water street, Liverpool.

Houlder Bros. Line.—For Australia: Adelaide, Melbourne, and Sydney. Houlder Bros., 14 Water street, Liverpool.

Cunard Line.—Royal mail steamers from Liverpool to New York and Boston. Accommodation for first and second class passengers. Steerage passengers to all parts of America and Canada; those by Boston steamers booked to New York without extra charge. Regular line of cargo steamers from Liverpool to Mediterranean ports. For freight, etc., apply to the Cunard Steamship Company, Limited, 30 Jamaica street, Glasgow.

Pacific Line.—Royal mail steamers, Liverpool to Pernambuco, Bahia, Rio Janeiro, Montevideo (Buenos Ayres and Rosario), Valparaiso, and all ports on the west coast of South America, calling at La Pallice (La Rochelle), Corunna, Vigo, Leixoes (Oporto), and Lisbon. Accommodation for passengers. Extra service of fast cargo steamers to Chilean and Peruvian ports without transshipment. Apply to the Pacific Steam Navigation Company, Liverpool, or to James Dunn & Sons, 107 St. Vincent street, Glasgow.

Anchor Line.—From Liverpool to Bombay, Kurrachee (cargo for Kurrachee transshipped at Bombay), and Calcutta direct. Henderson Bros., 47 Union street, Glasgow.

Johnson Line.—Liverpool to Baltimore. Freight boats.

Leyland Line.—Liverpool to Boston. Freight service. Average time of passage, ten days.

Mississippi and Dominion Steamship Company.—Liverpool to Portland Fortnightly service. Steamships and their gross tonnage: *Vancouver*, 5,231; *Labrador*, 4,737; *Oregon*, 3,672; *Sarnia*, 3,691; *Toronto*, 3,316; *Dominion*, 3,176; *Ontario*, 3,175.

Chesapeake and Ohio Steamship Company.—Liverpool and London to Newport News. Freight service. Time of passage, twelve to fourteen days.

West India and Pacific Steamship Company.—From Liverpool to New Orleans. Five times a month during winter months, and three times a month during summer months. Passenger and freight service.

LONDON.

Orient Line.—Australia, New Zealand, and Tasmania. Fornightly mail service from London (Plymouth one day later, Naples nine days later), for Albany, Adelaide, Melbourne, and Sydney, with Her Majesty's mails, calling at Colombo, and taking passengers for all ports in Australasia. Passengers leaving seven days after steamers leave London, and traveling overland, can overtake the steamer at Naples. Loading berth, Tilbury docks. Managers, F. Green & Co., and Anderson, Anderson & Co. Head offices, Fenchurch avenue, London. For passage, apply to the latter firm at 5 Fenchurch avenue, E. C., or to the branch office, 16 Cockspur street, Charing Cross, S. W.

McIlwraith, McEacharn & Co., Limited.—To Australia. (For particulars, see same company under Liverpool.) McIlwraith, McEacharn & Co., Limited, 3 and 4 Lime Street Square, London, E. C.

Peninsular and Oriental Steam Navigation Company.—London to Bombay and Kurrachee; Calcutta and Ceylon; Adelaide, Melbourne, and Sydney, connecting with China, Straits Settlements, and Japan. This line carries the British mails. For passage and freight, apply at 122 Leadenhall street, and 25 Cockspur street, London, S. W. Freight brokers, Escombe Bros., Liverpool, Manchester, Southampton, Glasgow, and London. Parcels 4d. per pound.

Bibby Line.—London and Liverpool to Rangoon and Colombo, via Marseilles. Taking goods at through rates for Indian coast ports, transshipment at Colombo, and for Burmese ports, with transshipment at Rangoon. Fast mail steamers, built by Harland & Wolff, of Belfast. For freight or passage, apply to Simpson, Howden & Co., 1 Princess street, Manchester; William Jeffrey & Co., 7 Royal Bank place, Glasgow; C. Howard & Sons, 45 Leadenhall street; Alexander Howden & Co., 138 Leadenhall street, London, E. C.; or to the owners, Bibby Bros. & Co., 26 Chapel street, Liverpool.

New Zealand Shipping Company.—For New Zealand, Australia, Cape Town, and Teneriffe. Royal mail steamers. Monthly sailings from London, Plymouth two days later. Apply to Gray, Dawes & Co., 4 Pall Mall East, S. W., or to J. B. Westray & Co., 138 Leadenhall street, E. C.

Castle Line.—Cape and Natal mails. Weekly service for the gold fields of South Africa. The Castle Company's steamers leave London (East India dock basin) every Friday, and sail from Southampton every Saturday, calling at Madeira, Canaries, Madagascar, and Mauritius. Return tickets to all ports. Free tickets by Castle express from Waterloo to Southampton. Apply to Donald Currie & Co., 3 Fenchurch street, London, E. C., and 40 St. Enoch Square, Glasgow.

Aberdeen Line.—London to Australia, via Cape of Good Hope, in forty-two days. These full-powered steamers sail for Melbourne and Sydney, taking passengers for all Australian and New Zealand ports. Fares, saloon, from £50 ($243.30); cheap third-class fares. Apply to the owners, George Thompson & Co., 24 Leadenhall street, London, E. C.

New Zealand Shipping Company.—Teneriffe, Cape Town, Tasmania, Australia, via Hobart, and New Zealand. Monthly service. Apply to J. B. Westray & Co., 138 Leadenhall street, London, E. C.; in Glasgow to M. Buchanan, 75 Buchanan street; D. S. Mitchell, 178 Broomielaw; G. Smith, 21 Hope street, and to Turnbull, Martin & Co., 8 Gordon street; or in Greenock, to A. Picken & Co., Arcade.

Peninsular and Oriental Company.—Carrying mails to India, China, Australia. For Bombay and Kurrachee, from London and Brindisi every week. For Calcutta and Ceylon semimonthly. For China, Straits, and Japan, from London every fortnight and from Brindisi every alternate Sunday evening. For Australia, New Zealand, and Tasmania, carrying Her Majesty's mails, leave London for Sydney, Melbourne, Adelaide, and Albany direct, calling at Brindisi, every fortnight; cheap single and return tickets; first and second saloon passengers

only carried; fares, £35 to £70 ($170.31 to $340.62). For Mediterranean and Egypt, from London to Gibraltar, Malta, Port Said, and Ismailia weekly; from Brindisi to Port Said and Ismailia weekly. The Peninsular and Oriental Company issue return tickets at low rates to India, Ceylon, China, Australia, Tasmania, New Zealand, Gibraltar, Malta, Brindisi, and Egypt, and round-the-world tickets at reduced rates. For freight or passage, apply at the company's offices, 122 Leadenhall street, London, E. C., or to Escombe Bros. & Co., 51 St. Vincent street, Glasgow; or for passage only to T. Cook & Son, 83 Buchanan street, Glasgow, or T. O. Hunter & Co., 13 Hamilton street, Greenock.

Macandrew Line.—For Spain. (For particulars, see this line under Liverpool.)

The Anglo-Australasian Steam Navigation Company, Limited.—The steamers of this line leave for Adelaide, Melbourne, and Sydney, from the Victoria docks. For freight or passage, appiy to the managers, William Milburn & Co., Queen street, Newcastle on Tyne, and 2, 3 and 4 Billiter avenue, London, E. C.

Aberdeen Line.—London to Australia, via Cape of Good Hope, in forty-two days. These steamers sail for Melbourne and Sydney, taking passengers for Teneriffe and Cape Town and for all Australian and New Zealand ports. For fares and full particulars, apply to the owners, George Thompson & Co., 24 Leadenhall street, E. C., or to the West End agents, Sewell & Crowther, 18 Cockspur street, Charing Cross.

Shaw, Savill & Albion Company.—For New Zealand, Tasmania, Australia, calling at Teneriffe and Cape Town outward and Rio and Teneriffe homeward. Shaw, Savill, and Albion Company, Limited, dispatch their royal mail steamers from London (Royal Albert dock) every four weeks, leaving Plymouth two days later. Passengers conveyed to Teneriffe and the Cape. Cheap rates, single and return. Round-the-world tours. Apply to Shaw, Savill and Albion Company, Limited, 34 Leadenhall street, E. C.; or 51 Pall Mall, S. W. Continental freight agent, August Blumenthal, Hamburg, Antwerp, and Rotterdam.

Houlder Bro.'s Line.—Australia, River Plate, etc. Houlder Bros. & Co.'s regular line of steamers for Adelaide, Melbourne, and Sydney; Montevideo, Buenos Ayres, and Rosario, calling at Las Palmas; Cape Town, Algoa Bay, Natal, Mauritius, etc. Houlder Bros. & Co., 146 Leadenhall street, London, and at 372 Cuyo, Buenos Ayres.

National Line.—To New York, weekly. Special accommodations for conveyance of horses and live stock. The National Steamship Company, Limited, offices, 44 and 45 Leadenhall street, E. C.

(The report of the United States Commissioner of Navigation for 1894 says of the National Line: This is the pioneer line in carrying across the Atlantic meat in refrigerators and live stock.)

Red Cross Line.—London to Moscow, via St. Petersburg, in conjunction with the Grand Russian Railway Company. Departures every few days by the steamers of the Red Cross Line. Loading berth Mill-

wall docks. Apply in St. Petersburg to Alfred Henley & Co.; in Moscow to Prollius & Wirckau; in London to C. M. Norwood & Co., 21 Billiter street, or to J. D. Hewett & Co., 101 Leadenhall street.

Wilson-Hill Line.—Service, chiefly freight, from London to New York, about every week, according to the conditions of trade.

Atlantic Transport Line.—Weekly passenger transport service, London to New York, Baltimore, and Philadelphia.

Furness Line.—London to St. John, New Brunswick, touching at Halifax. Four steamers of 1,400 tons each, fitted for freight and passengers; are well equipped and in good condition. (Report of American consul at St. John, New Brunswick.)

SOUTHAMPTON.

American Line.—United States mail steamers, Southampton to New York direct every Saturday. Liverpool, Philadelphia service, every Wednesday. Apply to Richardson, Spence & Co., Southampton or Liverpool; or A. Malcolm, 40 St. Enoch Square; Thomas Cook & Son, 83 Buchanan street, and M. Buchanan, 75 Buchanan street, Glasgow.

North German Lloyd Line.—The steamers of this line leave Southampton for New York direct on Wednesdays. Average passage, seven and a half days. Special train from Waterloo station on morning of sailing. Reduced cabin rates through from London.

Mail service from Southampton, taking passengers for Egypt, Aden, Colombo, Adelaide, Melbourne, Sydney, Tasmania, and New Zealand. These steamers offer accommodation to first and second clsas passengers; also third-class fares, outward and homeward.

Apply to Keller, Wallis & Co., 32 Cockspur street, Charing Cross; 65, 66, and 67 Gracechurch street, London; and at Manchester and Southampton (telegrams, Tuetonic, London); or Phillipps & Graves, Botolph House, Eastcheap, E. C.

Royal Mail Steam Packet Company.—To Brazil and River Plate, West Indies, California, and British Columbia, from Southampton, as under: On every alternate Friday to Vigo, Lisbon, Pernambuco, Bahia, Rio de Janeiro, Montevideo, and Buenos Ayres; also, every fourth Friday to St. Vincent and Maceio. On every alternate Wednesday for the West Indies, Pacific, California, British Columbia, etc. A steamer also leaves London every four weeks for Barbados, Trinidad, Grenada, St. Lucia, Jamaica, Savanilla, Carthagena, Colon, Limon, and Greytown. Full particulars can be had on application at the company's offices, Southampton; Alexander A. Laird & Co., 52 Robertson street, Glasgow; or to J. M. Lloyd, secretary, Royal Mail Steam Packet Company, 18 Moorgate street, London, or 29 Cockspur street, S. W.

Union Line.—Mail steamers to gold fields of South Africa, Natal and East Africa, Madeira and Teneriffe. Departures from Southampton every Saturday. Union Line express from Waterloo every Saturday. Free railway tickets from London to Southampton. Goods collected daily in Glasgow by Clyde Shipping Company for transshipment at

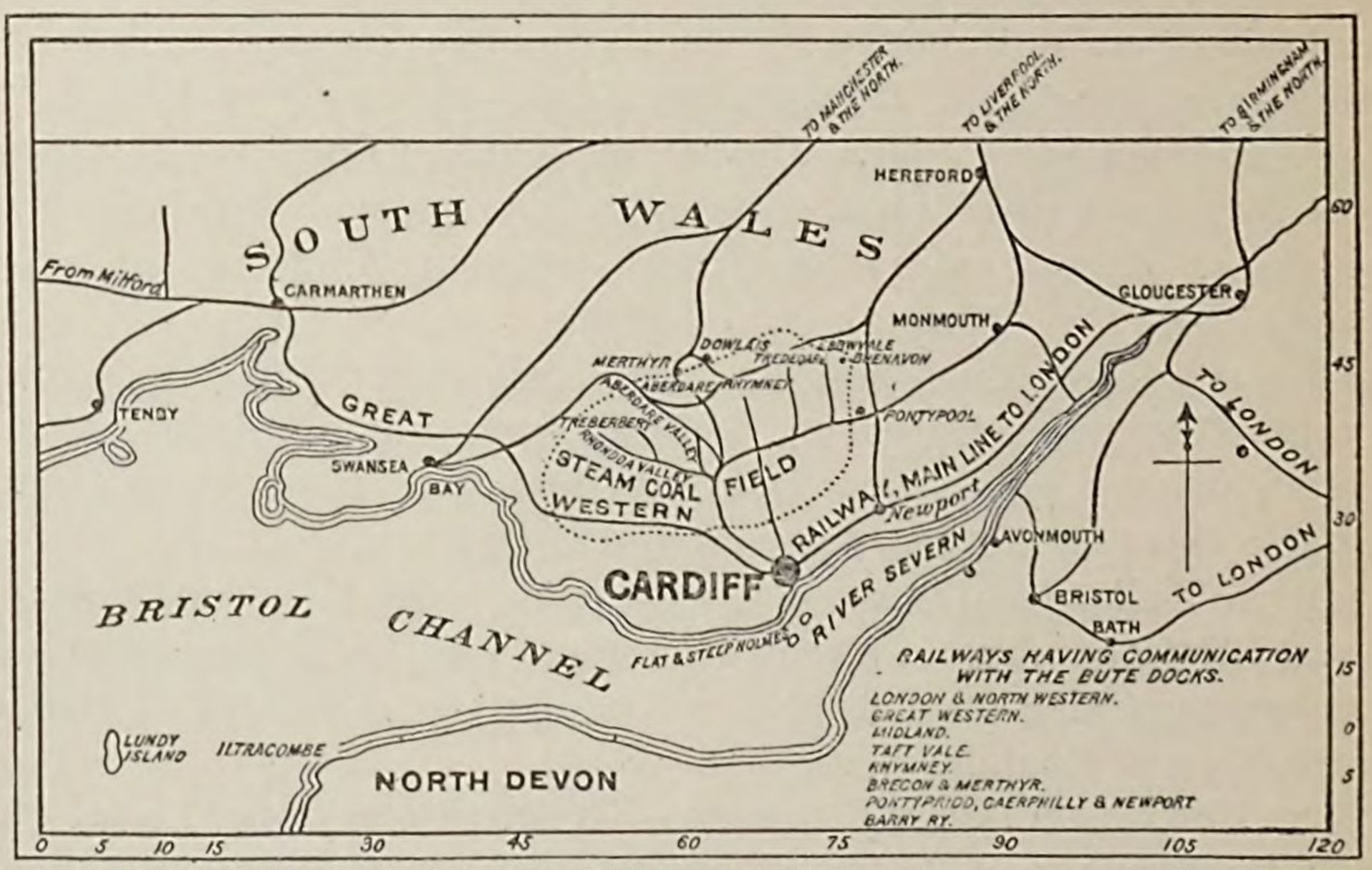
Southampton. Apply to Union Steamship Company, Limited, Southampton, and South African House, 94 to 96 Bishopsgate street, Within, London, E. C.; or to F. W. Allan & Co., 125 Buchanan street, Glasgow.

For ocean lines of Scotland and Ireland see reports from Glasgow and Belfast.

WALES.

WELSH COAL FIELDS.

The extensive development of the vast mineral wealth of the South Wales coal district, whose numerous little valleys have, for the most part, been robbed of their Arcadian simplicity and transformed into veritable beehives of industry, is responsible for the creation of most of its highways of commerce; therefore, introductory references to the



Map showing the relation of Cardiff to the Welsh coal field, its railway communication with the midlands and its maritime position.

natural features of the most important part of the principality of Wales are essential to a due appreciation thereof; and this will doubtless be enhanced by the outline map showing its maritime position. That development, during a comparatively recent period, has, in spite of universal depression of trade, been of quite a phenomenal character, as may be seen from the fact that, since the year 1875, the tonnage of vessels cleared at the port of Cardiff, the metropolis of South Wales, has actually trebled, and placed the port a good third in the United Kingdom for shipping cleared, and the first port in, probably, the entire world for the shipment of coal. The tonnage of vessels cleared in 1893 was no less than 7,123,602, the coal exports being 10,000,000 tons; and so great is the demand for Welsh steam coal that, in all probability, the figures will increase for many years to come. Huge docks are about to be added to those already in existence with a view

to meet the enlarged demand from foreign countries, while local railway facilities are being improved on every hand.

A glance at the map of the coal field will disclose the fact that its nearness to the Bristol Channel admits of the coal being speedily shipped ready for transport across the sea, and that the railway communication with London, Liverpool, and the other populous centers of the country by means of the three principal trunk lines of the Kingdom, viz, the Great Western, the London and Northwestern, and the Midland systems, respectively, indicate an enormous railway traffic. Coal, steel, and tin are widely distributed in this way, Liverpool, for instance, shipping a large quantity of Welsh coal for export and bunker purposes, to say nothing of steel rails and tin plates. Hence, from a commercial point of view, the industries of South Wales are of peculiar interest, and no report on the highways of commerce pertaining to this district would be complete without special attention being called to the country's characteristics.

The area of the South Wales coal field is 906 square miles, and it resembles in shape a pear, the basin of one coal field (which, by the way, is claimed to be the most perfect in the world) having its center near a town called Pont-y-Pridd, a dozen miles from Cardiff. Along the coast, beginning at Newport, the docks there and those at Cardiff and Swansea, together with those of several smaller ports, are within easy reach, and all engage more or less in the shipment of coal. The import trade, on the other hand, is insignificant, because hitherto Welsh capitalists have been kept so busy by their coal that they have not been able to devote attention to imports; yet there is much said and written, locally, about developing these at Cardiff in the near future.

The coal field is served by a number of competing lines, and every year large sums of money are sunk in Parliamentary warfare on the part of those who either promote or oppose new schemes of railway extension, the jealousy of rival proprietary interests being brought to bear against any and every scheme brought forward. So that South Wales is an El Dorado to lawyers as well as mine operators.

OCEAN LINES.

Notwithstanding the large export trade of the South Wales ports, Swansea stands alone in having an ocean line providing regular communication with New York and Baltimore, for no other Welsh port has any established ocean line. Speaking generally, the greater portion of the vessels plying between Cardiff and elsewhere are ocean tramps, dependent upon the agents of their owners for chartering, because from no part of the world can return cargoes be obtained in sufficient quantities to allow of regular communication. Exceptions in one or two respects to the general rule are to be found, as in the case, for instance, of the iron-ore trade with Spain. The era of Bessemer and Siemens steel making abolished the use of native ore for the manufacture of iron, so within the past twenty years a considerable trade has sprung up between Cardiff and certain Spanish ports, notably Bilbao, and vessels arriving

with ore take out, as a rule, coal for one or other of the French ports on their way back to Spain, or, on the other hand, boats are chartered in France to run to Spain for a cargo of ore to be brought here. Frequent communication with Mediterranean ports takes place in the case of many vessels, for the simple reason that the mine operator, shipper, and shipowner are represented in the same corporation, and oftentimes these "coalers" run to the same point; but speaking generally, nothing is so regular as the irregularity of the trips run.

I may here add that what bids fair to become an important enterprise is being initiated by a local firm, who intend putting on a fleet of ten steamboats to ply between Odessa and Rotterdam with grain, and thence to Cardiff with general cargoes; and it is hoped that the Midlands will be extensively tapped for the outward-bound voyages from Cardiff.

The establishment of a line of steamers about twenty years ago between Cardiff and New York was not successful; but in the meantime Cardiff has more than doubled itself, and facilities for sending American produce inland have been immensely improved, and it is claimed that rates quoted by the railway companies having local connections are such as to enable an importation of American produce to be carried on with profit. When a similar enterprise is again started, as I have no doubt will be the case sooner or later, the efforts to establish a trade will be more vigorous, and will consequently command better results.

A company is being formed to promote a new Anglo-Canadian service, as it is called, and a Mr. James Huddard, the managing director of that company, has been instituting inquiries respecting facilities for a new and direct route to Canada; also to Australia, India, Japan, etc. He has visited Milford Haven already, and has selected it as one of the ports on the English side from which the final choice of a point of departure will be made. It appears that Mr. Huddard, Mr. Colman, C. M. G., secretary for Canada in England, and all forming the party of inspection, were favorably impressed with the advantages of that port. A deputation from Cardiff afterwards saw Mr. Huddard and pointed out to him the immense saving in the matter of the bunker coal available at Cardiff, which port was also shown to be excellently situated as a distributing center for the populous South Wales mineral district, and in having means of ready communication with the Midlands and London. Cardiff is already within three and three-quarters hours of London, and for the purposes of a large transatlantic passenger traffic, the time might be reduced to three and one-half hours. A deep sea-water entrance would necessarily have to be made should Cardiff be chosen; but as the Bute interests are anxious to have the new ships enter their docks here the work would certainly be accomplished within the period of eighteen months which will be occupied in building the ships.

The coastwise traffic is not very considerable, and is somewhat irregular; daily trips, however, are run to Bristol for both passengers and

freight, and a number of pleasure boats make frequent runs in the channel. The most ambitious scheme affecting Cardiff is the formation of a harbor trust, which has been in contemplation for several years past. A committee, appointed by the city to specially investigate the subject, presented an exhaustive report early this year in favor of the project. The committee are now asking for authority to engage experts to examine the books of the various companies to be dealt with, and to report upon the earnings, etc., the desire of the city corporation being to acquire not only the dock and the adjacent properties, but also to possess themselves of a large area of vacant land in the vicinity which would become very valuable as sites of factories and houses in close proximity to the docks. The great object in view is the floating of the natural harbor, and no place better suited for a great port can be found on this coast line; for, besides the water, there are here good shelter and the cheapest fuel. One consideration, and that by no means the least important, is that if the harbor were floated Cardiff would become a competitor for the Atlantic traffic, its geographical position being better than that of Liverpool or Southampton, and its proximity to the coal field giving it a great advantage over Milford Haven.

RAILWAYS.

The coast line is skirted by the Great Western Railway, the largest in the country, so far as mileage is concerned, and it has, consequently, the lion's share of the general traffic, because of being in communication with all of the ports of the Bristol Channel, besides affording the most direct route to London. The Great Western has thus practically a monopoly in dealing with the traffic between the ports and London, and absolutely so in respect of passengers, it being generally accepted as a fact that the returns from the Cardiff depot are larger than from any other station on the system, with the exception of Paddington (London). The distance between Cardiff and London, via the Severn Tunnel is 156½ miles; and via Gloucester, 170 miles, the greater portion of the freight, as well as much of the passenger traffic, being carried along the latter route. The line touches the South Wales district at Newport, 12 miles nearer London than is Cardiff, and the South Wales branch proceeds by way of the other ports to Milford Haven, its terminus, which is a distance of 271 miles from London by the nearer route.

At Newport, a branch runs to Pontypool Junction, 8 miles distant, and here subsidiary branches run in various districts to the western valleys of the coal fields; junctions being formed also with lines in the eastern valleys, the heads of which are generally at a distance of about 20 miles from Newport or Cardiff.

The Great Western does not differ from any of the other railways in being beyond praise, so far as the condition of the tracks is concerned, for it must be conceded that the greatest care appears to be taken for the safety of life and limb, with the result that the number of fatalities on the railways is comparatively small. The lines are invariably fenced in and have scarcely any grade-level crossings, the board of trade regu-

lations making it incumbent to avoid such wherever possible. Depots are, in all cases, inclosed, and even the smaller places have two platforms, the larger depots having more than that number. At Cardiff, there are three depots, and owing to the large volume of traffic the Great Western station is about being enlarged at a cost of £150,000 ($729,900). The tracks are all 56½ inches gauge, with an intervening space of 6 feet, and they are well ballasted with cinder (obtained from the steel works in the district) or limestone to a depth of about 18 inches. The rails used on the Great Western system are of a heavy section (double-head), weighing 94 pounds per yard, each rail being 32 feet in length, while the London and Northwestern Railway's rails are 30 feet in length, and are of a "bull-head" section, weighing 96 pounds per yard. (These figures do not apply to the bridge rails, which are considerably heavier.)

The double-head rail finds most favor among the railways generally because the "bull-head" will not allow of its being turned upside down when the upper crown has been worn thin. The bridge rail, I may add, is a hollowed enlargement of the T-head rail (which latter is rarely used here), the bridge rail having thus a different section to allow of its being laid on longitudinal sleepers. The sleepers are invariably creosoted, and ordinarily are placed about 3 feet from center to center, each having fixed upon its surface at both ends a "chair" fastened thereto by spikes and wood screws. The rail passes through the chair and bears against the inside end of the open seat, an oaken key slightly tapered being used as a wedge and driven home by a hand hammer on the outer side. Every morning, at 6 o'clock in the summer and an hour later in the winter, the gauger walks his "length," viz, the section of the line under his control, to see that the wedge keys are tight, and that his section is in perfect condition generally. At depots and junctions he has also the care of the switch points.

On all tracks along which passengers or through freights are conveyed, the points are attached to signal cabins, and are connected with an interlocking system which must be approved by the inspector appointed by the board of trade before any line can be opened for traffic. Not only have the facing points to be interlocked with the signals, but each pair of points has a crossbar connection with two nearly center holes, into one of which a plunger, measuring a couple of inches in diameter, enters, and thus insures the closing of the corresponding tongue before the lever attached to the semaphore signal can be moved and the signal thus pulled off; nor can the switch be turned between the wheels of engines or cars, even should the pointsman or signalman err in putting the signal on and attempt to pull the plunger by mistake, there being attached to it a flat bar arrangement, over which the flange of one or other of the wheels is passing until the last has cleared. The interlocking system in vogue on the Great Western Railway is known as Saxby & Farmer's patent, the firm bearing that name being responsible by contract for the fitting of same; another well-known firm of

manufacturers of railway-interlocking apparatus being Holland & Mackenzie. The London and Northwestern Railway Company have a system of their own patented, as are their locomotives, by Mr. Webb, their chief engineer.

The track of all railways is doubled, with the exception of some of the short and subsidiary lines, on which the tablet system is in vogue in place of the old plan of "staff and ticket." Formerly a train proceeding on a single line would be authorized to do so by either the staff or a ticket obtained by the pointsman or signalman from a box which could be unlocked only by the staff; and when the latter was out no train could proceed in the direction controlled by the staff until its return. Apart from the serious delays often occasioned by the staff being at the wrong end of the section, the man could take out a ticket whenever he pleased; hence the tablet system is made compulsory, because he can not, of his own accord, release a tablet from the locker apparatus in which it is kept until the man in advance empowers him to do so by giving "line clear" on the electrical indicator and pressing a knob which allows of a tablet being abstracted. The line is then "blocked," and "line clear" can not be repeated until the tablet has reached its destination and been placed in position, so that a collision is rendered impossible.

The Great Western through freight trains are frequent, but only one through train of passenger cars is run to London via the Severn tunnel, and seven via Gloucester during the day. This service is said to be inadequate, and several public meetings have been held in certain towns affected in favor of a proposed new line which, it is claimed, would bring London 30 or 40 miles nearer and destroy the monopoly which now exists. Passenger cars usually have five compartments, each of which has two seats accommodating ten persons, and although there has been marked improvement within recent years, the comfort of traveling is much less than is afforded by the cars in the United States. Most of the trains are devoid of lavatories (for the use of which conveniences at the stations 2 cents is charged) the exceptions being the through Scotch, Irish, and London express trains, whereon great improvements have recently been effected, including the introduction of the Pullman sleeper.

Passenger rates.—The passenger rates are uniform according to mileage except where competitive traffic obtains; as, for instance, in traveling from Cardiff to London, the fare is the same on the London and Northwestern Railway as on the Great Western Railway, although the former route is one-third longer; and the same rule holds good respecting freights. The first-class passenger fares are $4\frac{1}{2}$ cents per mile; second class, $3\frac{1}{4}$ cents, and third class, 2 cents by act of Parliament for at least one train daily. Thus the fare is termed the parliamentary one, the difference imposed by the other trains being a few pence more on each ticket. The latest intelligence is to the effect that the third-class fare is to be abolished on the Great Western Railway, so that only parlia-

mentary fares will be charged, and doubtless other systems will follow suit.

Freight rates.—The freights are arranged in classes, a revision of the maximum charges having recently been made by the board of trade, the authority charged with the enforcement of the stringent railway and canal laws. Freights are carried in variously designed cars, denominated "wagons" and "trucks," of a capacity of from 8 to 10 tons and having four wheels only, the cars used for the conveyance of coal being almost invariably owned by either the operators or the shippers, the same remark applying to iron and steel manufactures. The tariff rate on coal from the mines to the Cardiff docks is 0.875 of a penny, equal to $1\frac{3}{4}$ cents per ton, and the average haul of same is 20 miles. All rates are charged per ton, and parcels under 500 pounds in weight are proportionately dearer. The general goods rates from Cardiff to London—distance, $156\frac{1}{2}$ miles—range from 28 shillings per ton (equal to $6.80) for heavy goods to between 33 and 49 shillings ($7.02 and $11.92) for light goods. These charges include collection and delivery, and a special rate for car loads between station and station is fixed at 14s. 10d. ($3.60), together with a further special rate of 13s. 4d. ($3.24) for the conveyance of timber in not less than 4-ton lots. The distance from Cardiff to Bristol is no more than 40 miles, and an enormous proportion of the produce imported into the ancient city of Bristol is distributed over South Wales. The rates to Cardiff are but very little below those to almost any point in the district, and vary from $2.12 to $4.05, car-load freightage being $1.05. These figures are favorable compared to those charged on similar goods from Liverpool, whence a good deal comes under charges ranging from $5.49 to $11.50, with a special rate of $4.78, the distance to Liverpool being 155 miles, which is practically the same as to London. Strange to relate, while the passenger fares to Manchester are a little lower than to Liverpool the goods rates are of an average of $2 per ton higher than to the latter place, and doubtless that difference will be maintained as long as the railway companies can do so, in order to foster the Liverpool import trade as opposed to that of the Manchester ship canal.

Speed of trains.—The speed attained is not usually high, for the simple reason that the depots are very close together, the average distance between them being no more than 3 or 4 miles. In many instances the distance is so short that, prior to the introduction of the continuous brake, the speed must necessarily have been slow in such places; and even now that this is fitted to every passenger train, according to the regulations laid down by the board of trade, the average time made on local railways is scarcely 25 miles per hour, although the engines used are capable of traveling at a high speed. On most of the leading lines, the Westinghouse brake is used, and in the case of through trains, which do not stop at the smaller stations, the distance covered averages about 35 miles an hour.

Character of service.—I find that the service is for the most part excellent, as passenger trains run to the various local points every hour or two, and to the most important parts of the Kingdom several times during the day. On Sundays the trains are fewer, as are also the through connections, the London and Northwestern line being almost alone in its refusal to run trains on the first day of the week. The Taff Vale Railway track is quadrupled for the most part, and as a large volume of coal is daily brought to Cardiff, the line is esteemed the busiest in the Kingdom, and is, moreover, the oldest in the principality. Its farthest point is 24 miles from Cardiff, at a place named Merthyr Tydvil, where, in February, 1804, Trevethick's first locomotive ran on rails and won a heavy wager, in spite of the bricked chimney being knocked down by the first bridge reached. The Taff Vale Railway was not fully opened until 1841, although the act of Parliament was obtained in 1836 upon a report drawn up by Brunel, the great engineer. This railway, in common with the Rhymney Railway, the Brecon and Merthyr, and the Rhondda and Swansea Bay lines, all serve as auxiliaries to the Great Western Railway, the London and Northwestern Railway, and the Midland system of inland traffic.

Grades and bridges.—As a consequence of the hilly nature of the district, steep gradients are frequently met with, one on the London and Northwestern Railway being 1 in 36; and up this line a considerable mineral as well as passenger traffic is conveyed. At the tops of the valleys, at, say, 20 miles from Cardiff, an altitude of nearly 2,000 feet above the sea level is reached, an average grade of 75 feet to the mile for a distance of over 20 miles being common.

Of bridges, the Crumlin iron girder bridge, near Newport, is the finest structure of its kind in the United Kingdom. It has ten spans of 150 feet each, making a total length of 1,500 feet, and its height is 204 feet, the cost amounting to £200,000 ($973,200). The Maesycwmmer viaduct has sixteen stone arches, is 876 feet long, and 169 feet in height; and the Cefu-Coedycymmer viaduct has fifteen arches of 40 feet span, and a total length of 725 feet, its altitude being 115 feet, and the cost of erection £125,000 ($628,650).

Tunnels—A considerable number of railway tunnels have been necessitated by the hilly character of the country, but these are completely overshadowed in importance by the Severn tunnel, constructed for the purpose of shortening the Great Western Railway route from South Wales to Bristol and London. For nearly 4 miles it passes underneath the Severn River, and so great were the obstacles arising from the frequent flooding of the workings that more than thirteen years were occupied, and an expense involved of nearly £2,000,000 ($9,732,000). The tunnel is $4\frac{1}{3}$ miles in length, 25 feet wide, and 20 feet high. It has a double track of bridge rails laid on longitudinal sleepers. In lining the tunnel no less than 75,000,000 vitrified bricks were used. It is pierced from 50 to 100 feet below the bed of the river, and beneath it runs a 9-foot driftway, and below that again is a 5-foot circular drain.

During the construction the workings were flooded four times, twice by land springs which poured in at the rate of 27,000 gallons per minute.

Corporate management.—All the railways are in the hands of private corporations subject to the limited liability act, and therefore termed limited liability companies; and most of them are good paying concerns, notably the Barry Dock and Railway, promoted by freighters who were dissatisfied with the facilities provided by the docks owned in Cardiff by the Marquis of Bute. In the days of its monopoly the Taff Vale system paid dividends to its ordinary share holders of as much as 18 per cent, but the Barry Company now lead with a 10 per cent dividend.

NAVIGABLE RIVERS AND CANAL LINES.

There are no navigable rivers in this district save the Severn, which opens out into the Bristol Channel near Newport, and a great deal of money has been expended, to some purpose, within recent years, in deepening the river, the Cardiff City corporation and the Bute Docks (Cardiff) Company, in conjunction with Worcester City and other towns, having subscribed to the cost of improvement with a view to developing the import trade with the Midlands. Hitherto the traffic has not been considerable, but the gain which Cardiff expects to derive will accrue for the most part from its character as an entrepôt or a place of exchange of commodities from small to large bottoms and vice versa. Already, vessels of a fairly good tonnage can steam or be towed to within 30 miles of Birmingham, the metropolis of the Midlands. It is intended to make a Birmingham ship canal, which involves the task of making a practicable waterway between that city and Worcester in connection with the Gloucester and Berkeley Canal to the Bristol Channel by way of the Severn. The plans are based upon a 200-ton coasting steamer or a 250-ton lighter, and as the upper portion, which is 30 miles long, rises by a series of locks to 425 feet above the river level, a hydraulic incline is proposed so that the boat will pass into a carriage caisson or trough filled with water and closed at both ends by gates or lifting sluices. The caisson is carried on a large truck, the framework of which is deeper behind than in front so as to carry the caisson in a horizontal position, and the truck rests on several wheels running along a railroad, the motive power to be hydraulic. What will become of this scheme is problematical, but anyway, it tends to show how desirous freighters are for developing the import trade.

There are several canals in South Wales, but the only one worthy of mention is the Glamorgan Canal, which runs alongside of the Taff Vale line from Cardiff to Merthyr. The bill for the construction of the canal was promoted in Parliament in 1784, the opening taking place ten years later. The canal, as well as the docks at Cardiff, is owned by the Marquis of Bute.

HIGHWAYS.

A balloon view of this district would show a complete network of railway lines and highways intersecting one another. Since the county councils act came into force a few years ago, the highways, outside of

the urban districts, are all controlled by those bodies, and scarcely five years have elapsed since the South Wales turnpike tolls were abolished by act of Parliament. The "Rebecca riots," in 1841, in certain parts of South Wales were caused by the extraordinary number of turnpike gates which had been fixed there; and although a great reduction was effected as the result of so practical an outburst of indignation half a century ago, tolls were exacted in South Wales for a long period after their abolition in other parts of the Kingdom, each township having at either end a tollgate similar to what prevailed in the time of Dick Turpin.

Railways have stolen the through traffic of the highways, and, since the stage coach has gone the way of all things, the only through traveler on the roads is the cyclist or the tramp. Nevertheless, the highways are more extensively used than ever in the populated districts as a result of the more frequent communication between adjacent townships and the rural districts caused by a spirited competition in both the solicitation and delivery of orders of a domestic nature by retail tradespeople. Between the various places, there are generally to be found several roads, but one of these is usually termed the highway, and invariably it is maintained in better order than the others. One is forcibly reminded of the old saying that "All roads lead to Rome," for here the highways lead to or from London, and milestones are fixed telling the number of miles, and occasionally quarter-milestones. In numerous instances, the distance to London may be read, as was the case in the days of Dick Whittington of old.

Some of the old Roman roads still remain practically as they were made by the ancient invaders, and at Caerleon, near Newport, abundant evidence is afforded of Roman occupation by the exposed ruins of an old town. These roads, like the parish roads generally, are narrow, compared with the recognized highways, which are about 20 feet in width, and are invariably macadamized, some of the principal roads having been made under the supervision of Macadam himself.

In conclusion, I may state that the roads are, for the most part, similar to the highways, with the exception that steam-roller crushing engines are utilized for making the roads smooth in the cities, and, although that desideratum is brought about, there is every reason for loud complaint against the dust given off by the limestone used in their composition if the water cart be not utilized regularly during dry weather. The principal thoroughfares have horse-car lines laid on granite blocks, and in other instances asphalt or wood is used. It is interesting to note that the city corporation of Cardiff intend introducing a special wood paving into the town made of a species of eucalyptus, to be imported from Australia at a cost of about 50 per cent dearer than ordinary timbers.

ANTHONY HOWELLS,
Consul.

CARDIFF, *June 28, 1894.*

SCOTLAND.

OCEAN LINES.

There are three ocean lines running from Glasgow to the United States, the Allan, Anchor, and Donaldson lines.

The first two carry passengers as well as freight. The latter does not make the carriage of passengers a specialty, and takes but few, and these not first class.

The Allan and Anchor lines average at least one ship per week each to New York, and sometimes two, if business requires it, and these return from New York to Glasgow, one of each line leaving New York each week.

ALLAN LINE.

Ports and vessels.	Tonnage.		Horse-power.
	Gross.	Net.	
To New York:			
Grecian	3,612	2,374	2,000
Norwegian	3,523	2,303	1,950
Peruvian	3,262	2,031	2,200
State of Nebraska	3,986	2,577	3,250
State of California	4,243	2,670	4,600
To Boston:			
Hibernian	2,997	1,873	1,900
Nestorian	2,725	1,679	1,400
Pomeranian	4,257	2,789	2,750
Prussian	3,029	1,940	2,000
Sarmatian	3,920	2,485	2,400
Scandinavian	3,067	1,967	2,000
To Philadelphia:			
Assyrian	3,970	2,608	2,500
Corean	3,487	2,258	2,000
Carthaginian	4,214	2,755	2,600
Siberian	3,903	2,558	2,600

Of these ships, running to Philadelphia, the *Assyrian* went by the way of Liverpool, St. John, and Halifax, and the *Corean* via St. John and Halifax.

All of the Allan Line steamships from Boston and Philadelphia, and the *Grecian*, *Norwegian*, and *Peruvian*, from New York, brought more or less of live cattle from the United States to Glasgow in 1893, and are well fitted for that business, and well managed, as shown by a loss of less than one-half of 1 per cent in the carrying of 1893.

The Allan Line sent a steamship to New York from Glasgow every week in 1893, except the first week in October and last week in November.

ANCHOR LINE.

Ports and vessels.	Tonnage.		Horse-power.
	Gross.	Net.	
To New York:			
Australia	3,592	2,321	1,350
Anchoria	4,167	2,713	2,854
Bolivia	4,157	2,561	2,914
Circassia	4,272	2,769	2,717
City of Rome	8,144	3,452	11,153
Devonia	4,270	2,771	1,403
Ethiopia	4,004	2,604	2,846
Furnessia	5,495	3,598	3,856
Scotia	2,762	1,788	1,100

The Anchor Line sent ships from Glasgow to no other port in the United States in 1893.

The Anchor Line missed the last two weeks in October and the third in November. Had it not been for the depression in trade between the United States and Glasgow in the latter part of the year there would have been no omission in weekly sailings of these two great lines.

The *City of Rome* made only four trips for want of business.

These steamships all made return trips from New York to Glasgow, so that there was every week a vessel of each of these lines leaving New York and Glasgow, except as above stated.

The *State of Nebraska* and *State of California*, of the Allan Line, and the *City of Rome*, *Anchoria*, *Ethiopia*, *Circassia*, and *Furnessia*, of the Anchor Line, are first-class passenger boats.

DONALDSON LINE.

Ports and vessels.	Tonnage.		Horse-power.
	Gross.	Net.	
To New York:			
Indrani	3,584	2,337	1,800
To Philadelphia:			
Nerito	2,919	1,872	(*a*)
Nerano	2,885	1,854	(*a*)
Prodano	2,475	1,624	(*a*)
Tritonia	4,272	2,719	2,200
To Portland, Me.:			
Warwick	2,526	1,648	1,500
Alcides	3,344	2,193	2,100
Amarynthia	3,932	2,595	2,100

a Not obtainable.

Of these, the *Nerito*, *Nerano*, *Prodano*, *Alcides*, and *Amarynthia*, were also engaged in the live cattle trade from the United States while carrying other freight.

The *Indrani* made but one trip from Glasgow to New York, November 9.

Passenger rates.—The distance to New York from Glasgow is 3,011 miles, and the passenger rates, first class, from New York to Glasgow range from $40 to $60, according to style of berth or cabin, except in June or July, when the rates are $5 higher; second cabin, $25 to $35; steerage, $20 to $23.

All the vessels so far mentioned are built of iron or steel, are propelled by steam, and are safe and reliable boats.

The passenger ships are from nine to eleven days making a trip across the ocean, except the *City of Rome*, which usually makes the passage in seven days.

Tramp steamers.—Besides the vessels above mentioned, there were what are called "tramps" sailing from Glasgow to the United States in 1893, mostly in ballast, and returning with cargoes. From June 1 to December 31, 1893, three went to New York; three to Portland, Me.; three to Savannah, Ga.; three to Newport News, Va.; two to Balti-

more; and one each to Brunswick, Ga., Beaufort, S. C., Hampton Roads, Va., Delaware Breakwater, Philadelphia, Mobile, New Orleans, Apalachicola, Fla., and Sapello, Ga.

Ownership of lines.—The Anchor Line is controlled and owned by Henderson Bros., of Glasgow; the Allan Line by the firm of James & Alexander Allan; and the Donaldson Line by Donaldson Bros., of Glasgow.

Eastern connections of Anchor Line—The Anchor Line has extensive communications of its own with Mediterranean ports and with India. Its ships brought freight in 1893 from the United States to Glasgow destined for Edinburgh, Leith, Perth, Aberdeen, and other points in Scotland; and to Belfast, Limerick, Cork, Dublin, and Londonderry, in Ireland; and Newcastle, England. These are the prominent points in the United Kingdom. Most of the freight brought by this company, and also by the Allan Line, going to smaller places in Scotland, is distributed by the wholesale merchants of Glasgow. The Anchor Line also brings goods to Glasgow destined for Bombay, Calcutta, Rangoon, Singapore, China and Japan.

This line has steamships running from Liverpool to Bombay and return, one boat leaving every two weeks and regularly from the same place to Calcutta. First-class cabin passage to Bombay or Calcutta, £45 ($218.99). These vessels in the India service come to Glasgow and take more or less freight from here. There are sixteen steamships of this line running to India. The ships for Bombay call at Port Said, Ismailia, and Suez, and those bound for Calcutta stop at the same places, and, if necessary, touch at Gibraltar.

Distance from Glasgow, via Liverpool, to Gibraltar, 1,490 miles; to Port Said, 3,389; to Suez, 3,479; to Bombay, 6,490, and to Calcutta, 8,110.

New York and Mediterranean service.—There are also eleven steamships of the Anchor Line running from Mediterranean ports to New York, one leaving every fortnight. Some of these vessels also leave Glasgow for the Mediterranean every fortnight. Rates of passage, cabin fare: From Glasgow to Gibraltar, £7 ($34.06); Genoa, £11 ($53.53); Leghorn, £12 ($58.39); Naples, £13 ($63.26); Trieste, Messina, Catania or Palermo (via Italy), £15 ($72.99).

The steamers of the Anchor Line in the Glasgow, Mediterranean and New York service are as follows:

Name.	Gross tonnage.	Effective horse-power.	Name.	Gross tonnage.	Effective horse-power.
Alexandria	2,017	807	Elysia	2,713	1,403
Alsatia	2,810	1,938	Victoria	3,358	1,924
Caledonia	2,151	1,159	India	2,476	911
California	3,410	1,653	Italia	2,248	962
Columbia	2,029	948	Olympia	2,051	964

All these steamships carry passengers as well as freight.

Return tickets are granted at reduced rates.

Steamers of the Anchor Line leave Marseilles for Liverpool and Glasgow regularly. Cabin fare to Liverpool or Glasgow by direct steamer, £11 ($53.53).

The Anchor steamships from the Mediterranean to New York sail every fortnight, and call at the following places en route: Genoa, Leghorn, Naples, Messina, Palermo, Trieste, and Gibraltar. To or from New York or Boston the cabin fare is: To Gibraltar, £16 ($77.86); Genoa, Leghorn, and Naples, £18 ($87.59); Trieste, Messina, and Palermo, £21 ($102.19).

Character of service.—The condition of the Anchor Line is good. I have had personal observation and experience of the line in direct communication from Glasgow to the United States, and have found everything satisfactory as to safe and sanitary condition of the ships, the courtesy and care of its agents and officers as to passengers and freights, and its promptness and trustworthiness in the dispatch of business. I can say the same for the Allan Line.

History of the Allan Line.—The Allan Line was founded by Capt. Alexander Allan, who was the pioneer in the commerce of the Clyde with America, and began running a line of ships from the Clyde to Canada in 1815, a connection mainly kept unbroken to this day. Until 1837, the ships traded between Greenock and Montreal, but in that year, owing to the deepening of the Clyde to a draft of 15 feet, the Allan vessels began to come to Glasgow, and have continued to do so ever since. The ships of this line running from Glasgow to Philadelphia and Boston do not take passengers from these ports to Glasgow. All the New York vessels carry passengers both ways, and the Boston boats from Glasgow to Boston.

The Allan Line has thirty-one steamships in all, constructed of iron or steel, and in good condition. Besides the service from Glasgow to New York, Philadelphia, and Boston, their ships run from Liverpool and London to the United States and return, carrying freight. These steamers run to New York and from London to Portland, Me., and from Liverpool to Philadelphia and Portland, Me.

From about the middle of April to the end of October, this line maintains a weekly service from Glasgow to Quebec and Montreal and from Liverpool to the same places. The service from London is every ten days instead of weekly to same places. About fourteen steamers are engaged in the Quebec and Montreal service. A monthly service is maintained also from Glasgow and Liverpool to Montevideo and Buenos Ayres.

Vessels of the Donaldson Line.—The boats of the Donaldson Line are the *Indrani*, *Tritonia*, *Warwick*, *Alcides*, and *Amarynthia*. The others were chartered for the voyages made in 1893. A few carry passengers, but none of them to exceed twelve at one time. The line runs no boats

from Glasgow to other points than the United States in connection with the United States traffic. In 1893, they ran the following steamships from Glasgow to Montreal and Quebec:

Name.	Gross tonnage.	Net tonnage.	Effective horse-power.
Hestia	3,790	2,434	1,800
Concordia	2,544	1,617	1,500

This comprises the extent of their line. The freight charges on this line for 1893 varied according to the business of that year. Flour was carried, as reported by them, at 5s. ($1.21), 2s. 6d. ($1.82), 12s. 6d. ($3.04), and 14s. ($3.40) per ton; grain free to 3s. (83 cents) per quarter; provisions, 12s. 6d. ($3.04) to 20s. ($4.86) per ton; woodenware, 15s. ($3.65) to 22s. 6d. ($5.46) per ton.

Average freight charges.—The Anchor and Allan lines also varied in their freight charges, but the average from New York for 1893 was as follows:

Wheat	per bushel	$0.07	Hops	per pound	$0.0⅜@ 0.0¼
Oats	32 pounds	.07	Tobacco	per hogshead	4.20
Barley	per bushel	.07	Rosin	per ton	4.20
Corn	do	.07	Lard in small packages, per 2,240 pounds		6.00
Rye	do	.07	Tobacco in cases, per 40 cubic feet		4.80
Flour	per barrel	$0.36@ 0.48	Apples	per barrel	0.60@ 0.72
Flour in sacks, per 2,240 pounds		2.40	Hams	per 2,240 pounds	4.80
Clover seed	do	4.20	Butter	do	6.00@ 7.20
Bacon	do	4.20@ 4.80	Cattle	per head	9.60@10.80
Lard	do	4.20@ 4.80	Hay pressed in bales, per 2,240 pounds		7.20
Cheese	do	6.00@ 7.20	Measurement, per ton of 40 cubic feet		3.60@ 4.80
Tallow	do	4.20	Lumber, hard	per ton	4.20
Beef	per barrel	.72	Lumber, soft	do	5.40
Beef	per tierce	.96	Horses	per head	20.00@25.00
Beef, fresh, per 40 cubic feet		3.60			
Pork	per barrel	.72			
Oil cake per 2,240 pounds		2.40			

COAST STEAMSHIP LINES.

G. & J. Burns & Co. own a line of thirteen iron and steel screw and paddle steamers carrying freight and passengers from Glasgow to Manchester (260 miles), twice a week; to Liverpool (226 miles), three times per week; to Londonderry (135 miles), twice a week; also to Belfast from Ardrossan in connection with passenger trains, some touching at Isle of Man.

The Carron Company Line consists of seven iron and steel screw steamers running from Grangemouth to London, and carrying passengers and freight from the west coast of Scotland. Freight is taken from Glasgow either by rail or by the Forth and Clyde Canal to Grangemouth, and passengers on through tickets from Glasgow to pier at Grangemouth.

The Clyde Shipping Company own twenty iron and steel screw steamers running from Glasgow to London, via Belfast (795 miles), every two weeks; to London direct (758 miles), weekly, touching at Plymouth and Southampton on return voyage; Glasgow to Cork direct (352 miles), weekly; Glasgow to Limerick direct (428 miles), weekly.

The J. & P. Hutchison Company's ships are of iron and steel, with tonnage from 500 to 1,000, and sail from Glasgow to Rouen weekly; Nantes every ten days; Bordeaux weekly; Oporto fortnightly; Cadiz every three weeks; Malaga, and Stettin and Dantzic monthly, in season, and to Galway fortnightly.

The David MacBrayne Line is known as the Highland route. It consists of eighteen steamers, screw and paddle, connecting Glasgow with all ports to the north and among the Highlands. They carry passengers, freight, and mails.

RIVERS AND CANALS.

The only navigable river within this consular district is the Clyde. It is navigable only from Glasgow to its junction with the Firth of Clyde (at Greenock), which is an extension of the river, or an arm of the sea meeting the river. There are no ports upon the Firth of Clyde at which the large ocean steamers touch, but there is quite a coast-line business done, of which I have made mention.

It is 21 miles from Glasgow to Greenock by the river, and the stream has been made navigable for this distance after many years of hard labor and at great expense. The river is lined for a good share of its navigable distance by shipbuilding industries, and is constantly filled with shipping at anchor and under way.

Running out from the Firth of Clyde are many lochs or arms, places of interest, reached by coasting vessels and pleasure steamers, which run daily in the summer time.

There are two canals in this consular district, the Forth and Clyde and the Caledonian.

The Caledonian Canal is owned and controlled by the Government, and the dues are quite heavy and burdensome. The canal connects the navigable waters of the west coast in the north of Scotland with those of the east coast, commencing at the upper end of Loch Eil, near Fort William, and ending at Inverness, on Moray Firth, and passes through Lochs Ness, Oich, and Lochy. It is used for the transportation of passengers and freights by coasting vessels. The canal proper is only 22 miles in length, to which may be added 4 miles of dredging to deepen Loch Ness. It cost £1,350,000 ($6,569,100), and has not been profitable. Vessels from 500 to 600 tons can pass through it.

The Forth and Clyde Canal is owned and controlled by the Caledonian Railway Company. It commences at Bowling, on the Clyde, and runs to Grangemouth, on the Forth, with a branch to Glasgow. Its length is about 40 miles. The maximum draft of vessels entering

the canal is 8 feet 9 inches, and the ships are taken through with standing masts. Lighters owned by canal traders take the cargo of vessels drawing more than 8 feet 9 inches. The Caledonian Railway Company do not operate the canal; they are simply toll-takers. The rate of tonnage varies with the nature of the cargo. This canal affords a short route by water across Scotland from the Firth of Clyde to the Firth of Forth, and it is considered an easy and desirable passage.

Coast steamers in the district of Troon.—The following is a report of the consular agent at Troon, Andrew McMurray, esq., on the coast steamers in his district:

Ports and vessels.	Dimensions.			Nature of cargo.	Registered tonnage.	Owners.
	Length.	Beam.	Draft.			
Ardrossan to Belfast: *a*	*Ft. in.*	*Ft. in.*	*Ft. in.*			
Grampus *b* (daily)..	211 2	28 3	14 6	Mails, goods, and passengers.	288	G. & J. Burns.
Seal *b* (daily).....	210 7	28 4	14 4	.....do	281	Do.
Hound *c* (daily)....	250 3	32 1	15 5	.....do	332	Do.
Adder *c* (daily during summer months.)	280 3	13 8		.....do	146	Do.
Ardrossan to Newry and Dundalk:						
Newry *b*	176 6	24 0	13 0	.....do	185	The Dundalk and Newry Steam Packet Co., Limited.
Troon to Belfast:						
Kathlene *b*	155 7	23 1	11 8	Regular freight carriers, coal principally.	128	John Milligan, Belfast.
Eveleen *c*	171 0	26 1	12 6	.....do	160	Do.
Balnial *b*	174 0	26 1	12 6	.....do	217	Do.
Susanah Kelly *c*...	140 7	21 6	11 2	.....do	91	Do.
Troon to Dublin:						
St. Margaret *c*.....	175 0	26 6	10 5	.....do	185	Robt. Harper, Glasgow.
Marlay *c*	200 2	29 2	14 0	.....do	349	R. Tedcastle & Co., Dublin.
Ayr to Belfast: *a*						
Carrick *c*.....	186 0	28 0	14 2	Goods and passengers.	231	The Ayr Steam Shipping Co.
Ayr to Larne:						
Mona *b*.....	160 0	24 2	14 0	.....do	230	Do.
Stranraer to Larne:						
Princess Mary and other steamers. *c*	280 5	35 6	13 4	Daily mail and passengers.	368	John Thompson, Carlisle, managing owner.
Ardrossan to Isle of Man: *d*						
Peverill *b* (during summer months.)	207 6	26 0	13 0	Goods and passengers.	244	The Isle of Man Steam Packet Co., Limited.

a Fares, cabin, single, 9 shillings; return, 14 shillings. *b* Iron. *c* Steel. *d* Round trip, £2 11s. 6d.

Distances.

	Miles.		Miles.
Ardrossan to Belfast	72	Troon to Dublin	145
Ardrossan to Newry	120	Ayr to Belfast	65
Ardrossan to Isle of Man	114	Ayr to Larne	60
Troon to Belfast	69	Stranraer to Larne	39

RAILWAYS.

There are four lines of railways: Caledonian, North British, Glasgow and Southwestern, and the Western Highland.

The Caledonian Railroad.—The Caledonian Railroad is owned and controlled by a private corporation chartered by act of Parliament.

The total length of its lines is 876¼ miles, of which 144½ miles are leased. The main line, running from Glasgow and Edinburgh to Carlisle, England, connects with the London and Northwestern Railway at the latter place; and, in connection with it and the Great Western Railroad, runs express through trains to Bristol, Bath, Exeter, Torquay, Plymouth, and Penzance. There are also, in connection with the London and Northwestern Railroad, through trains to London, Manchester, and Liverpool.

The following are the distances in miles from Glasgow: To Carlisle 102, to Bristol 384, to Manchester 225, to Liverpool 223, and to London 405. Besides the main line to Carlisle there are branches as follows: From Glasgow west to and running through Greenock, whereit branches to Wemyss Bay; from Gourock steamers run to Port Rush, Ireland; from Wemyss Bay steamers run to the Isle of Arran, and Rothesay, in the Isle of Bute (it is 24 miles to Gourock and 31 to Wemyss Bay); from Glasgow southwest to Ardrossan, 29 miles, where steamers run in connection with trains to Brodick and Lamlash, in the Isle of Arran, and also to Belfast, Ireland; from Lugton, on this line, there is a branch to Kilmarnock, and a branch from Kilwinning to Irvine. From Glasgow eastward to Edinburgh, 45 miles; from Edinburgh the line runs northwest to Larbert, and from there to Stirling, Perth, Dundee, Forfar, and Aberdeen; and from Dunblane, between Stirling and Perth, a branch runs to Oban, in the western Highlands. From Glasgow a branch runs to Larbert. From Oban steamers run to Western Isles of Scotland and to various points on the western coast of the Highlands. From Ayr to Edinburgh, 77 miles. From Lockerlsie, on the main line, via Dumfries, a branch runs to Stranraer and Port Patrick. From Stranraer connections are made with steamers for Belfast. It is two hours' sail from Stranraer to Belfast.

There are numerous other small branches of this road running to various points of interest to tourists. In the Highlands connections are made with coaches and omnibuses, and almost any place desired can be reached without unnecessary delay. Local trains are run from Glasgow to suburban points for the accommodation of people doing business in Glasgow.

The condition of the Caledonian line is first class. The tracks are well laid and ballasted. There are no grade crossings in cities or rural districts. The track crosses all highways by bridges over or culverts under. At the stations the platforms are above the tracks and on a level with the floor of the compartments of the cars, which are entered by side doors. People going one way are landed upon one side of the tracks, and those going the other way, upon the other side. No crossing of the tracks at the stations is allowed. Danger to life and limb at these stations and at all crossings is well provided against, both by construction and by guards to warn passengers and loiterers.

The tracks are laid double on all principal lines, and upon through trains are run corridor cars with dining saloon and sleeping cars.

Communication between the larger places, and on main line, is very frequent, and abundant accommodation is furnished. To the smaller places the trains run as often as the business requires.

The manner of handling baggage in Scotland, while careful upon this as well as other railroads, is unsatisfactory, in that the baggage is all deposited together and must be claimed and identified at point of stopping. The check system is unknown, and baggage ought to be well marked, with name and address of owner.

There are two classes of passenger coaches and fares for the same—first and third. Third class, for short distances, is just as good as first, and much cheaper. The only difference is in the furnishing of the compartments. The maximum first-class rates are 3 cents and third class 2 cents per mile. Great reductions are made on round-trip tickets, and there are many cheap excursions, especially on Saturdays. There is probably no place in the world where the tourist can reach as many points of interest so cheaply as from Glasgow. Reductions are also made from Glasgow to various points in favor of annual, quarterly, and monthly tickets.

Freights are regulated by the board of trade and they vary with conditions of trade and route.

No great obstacles impede the roadbed except in the Highlands or mountainous districts where there are some heavy grades and numerous short tunnels.

Glasgow and Southwestern.—The Glasgow and Southwestern Railway is governed by a board of directors elected by the stockholders of the corporation. The corporation is chartered by act of Parliament. Points touched by this railway from Glasgow are, to the south and west, Greenock, Paisley, Johnstone, Irvine, Troon, Ardrossan, Largo, Kilwinning, Ayr, and Stranraer.

There is also a direct line to Carlisle, England, via Kilmarnock and Dumfries.

Distances in miles from Glasgow: To Greenock 25½, to Paisley 7½, to Johnstone 10¾, to Kilwinning 26, to Ardrossan 32, to Largo 36, to Irvine 30, to Troon 35, to Ayr 41½, Kilmarnock 24, to Dumfries 82, and to Carlisle 115.

At Kilwinning, the line divides and runs through Irvine, Troon, and Ayr to Stranraer. A branch runs from Ayr to Dalmellington. From Dalrymple, 4 miles from Ayr, a branch runs down the coast of the Firth of Clyde to Stranraer, about 44 miles. Stranraer is reached by this line from Glasgow, via Ayr, in a run of 99¾ miles. From Dumfries, a branch runs to Stranraer; distance, 75 miles. At Carlisle, the trains make connection to all parts of England, and through trains are run to London, Liverpool, Manchester, and other large cities in connection with the Midland Railway. At Greenock, Ardrossan, Largo, and Stranraer, connections are made with steamers running to all ports of the west coast of Scotland and east coast of Ireland. The total length of the road is 485⅝ miles, of which 129⅝ miles are leased.

The passenger mileage per day was 10,210$\frac{8}{10}$ miles in 1893. For the last half of 1893 the passenger mileage was 1,592,891 miles, and goods and mineral trains had mileage for same period of 1,368,805 miles.

The inspecting engineer reported at the end of the year that the line was in good working condition. The roads are well laid with rock ballast and pass under or over all streets and highways by culverts or bridges.

All the railway stations are in good condition and are supplied with bridges by which passengers cross over the tracks in passing from one side of the road to the other. Double tracks exist in all cases, and at the stations passengers alight upon a raised platform on the left side of the train. From Glasgow to Paisley four tracks are laid.

The mechanical construction of switches is of the best, and the block signal is in use throughout Scotland.

Trains leave Glasgow for principal stations about every hour. The service can not be criticised so far as attention and courtesy of officials are concerned. Both through and local trains are in use.

Passenger fares and freight same as the Caledonian, varying, in both cases, with amount of competition and business. The maximum of passenger fares is fixed by Parliament—not above 3 cents per mile first class, and 2 cents third class. The maximum of freights is fixed by the board of trade.

This road also has numerous cuts and short tunnels through the hills.

North British Railway.—This railroad is owned and operated by a private corporation, chartered by act of Parliament. Its total length is 1,097$\frac{1}{2}$ miles. It consists of 5$\frac{1}{4}$ miles of four-track, 7$\frac{3}{4}$ miles of three-track, 470 miles of double-track, and 614$\frac{1}{2}$ miles of single-track road.

The main lines run from Glasgow and Edinburgh to Carlisle, England, where connections are made with other railways to all the principal places in England; from Glasgow and Edinburgh through Berwick to Newcastle, England, and from Edinburgh to Aberdeen, in the north of Scotland.

There are numerous branch lines.

There are two through routes to England, viz, the East Coast route, through Berwick, Newcastle, Leeds, and York to London, and the Waverley route, which passes through Melrose, Hawick, and Carlisle to London. Liverpool and Manchester may also be reached on this route. Through trains on both these routes are run from Aberdeen through Dundee to London. Through trains run also from Aberdeen and Dundee to Edinburgh and Glasgow, via Tay Bridge, Fifeshire, and Forth Bridge; from Alloa and Stirling to Edinburgh, via Forth Bridge; from Glasgow to Perth and the north, and Glasgow to Stirling and Grangemouth; and from Edinburgh to Glasgow, and thence to Balloch and Helensburg.

Nearly every point of interest in the Highlands can be reached by this railway and its connections, and also all places of resort both on the east and west coasts of Scotland.

Special attention is given to tourists, and cheap excursions and reductions in fares are of frequent occurrence in the summer months.

Passenger accommodation and fares and freight charges are the same as upon the other railways, and tracks and stations are constructed and guarded as heretofore stated. The condition of the line is good.

Through trains run on the principal lines from three to six times a day each way, and suburban trains at least every half hour from Glasgow.

The West Highland Railway.—This is a private corporation chartered by act of Parliament.

The road commences at Helensburg, on the Clyde, about 22 miles from Glasgow, and runs through the western Highlands of Scotland to Fort William, a distance of 98¼ miles. It is single track, except at the stations, and its course is through a most delightful country of lochs and mountains.

The stations on the road are planned and located with special reference to the lochs and other points of interest to tourists and sportsmen. After leaving Helensburg, it skirts along the Gareloch, an arm of the sea, runs up to the head of Loch Long, another arm of the sea, and passes over to the side of Loch Lomond, a fresh water loch. It follows the west coast of this loch 8 or 10 miles, and goes through the moor of Rannoch, where it attains an altitude of 1,350 feet above the level of the sea; thence it goes down the east side of Loch Yreig, passing numerous other lochs before it reaches Fort William. From it, can be seen Ben Lomond, Ben More, and Ben Nevis, the highest mountain in Scotland. From Gareloch Head, the line gradually rises to an altitude of some 500 feet above the loch, along the side of which it runs with a heavy grade. This was a very difficult piece of engineering work, but it has been skillfully and successfully carried out.

This railway has been five years in construction and will be opened for travel in the month of July of this year. It will be the most picturesque railway route in Scotland.

HIGHWAYS.

There are no roads that have any distinction as highways of commerce. The chief transportation of freight is by rail and water, but all the principal roads of Scotland are macadamized and kept in the best condition. Tourists find excellent routes everywhere. The roads, on account of their uniform firmness and smoothness, are specially adapted for carriage and bicycle riding and for walking. They are inclosed everywhere, except in the Highlands, by walls or hedges, and frequent guide-posts notify the traveler of their route and the distance between intervening points of interest.

ALLEN B. MORSE,
Consul.

GLASGOW, *June 19, 1894.*

IRELAND.

RAILWAYS.

There are three important railways in the north of Ireland, viz, the Great Northern, the Belfast and Northern Counties, and the Belfast and County Down. Each one of these has several minor branches which facilitate communication with all towns of any importance. The condition and character of these railways in certain respects are outlined fully in the details which follow. Such conditions as smoothness of track, comfort, speed, and safety are measured largely by comparison; what might be fairly good in the estimation of one traveler might be considered poor indeed in the estimation of another. There is this to say, generally: To the American traveler, the compartment system, which prevails altogether, will not commend itself, as a rule, because the car is cramped, not as well lighted and ventilated or as well finished, nor has it the conveniences of a first-class carriage on the principal trunk lines in the United States. This applies to the first and second class coaches; third-class coaches are very inferior in these respects. It is noticeable that within the past two years marked improvements have taken place. Where new cars replace the old ones, of whatever class, there is an improvement in their fittings, such, for instance, as electric lighting and upholstering better adapted to comfort. The new third-class coaches are still considerably inferior to the American carriage, although far superior to the old ones in comfort and convenience. Passengers once inside the compartment must remain there until the train stops. For short distances, the traveler can put up with them.

The speed varies according to the train; the minimum is about 20 miles an hour; the maximum about 45 miles. All railways are operated on the block system; they are well provided with approved safety appliances; the lines of trackage are carefully inclosed and protected from straying stock, etc.; no one except employees is permitted to walk on, or alongside, or to cross the tracks. Stations are so arranged that the entrances and exits are either over or under the tracks, through covered ways, where it is necessary to cross from one platform to another. Surface crossings are rare, and accidents less frequent than in the United States. The officials and attendants are generally civil and accommodating. Baggage is handled by porters employed by the railway company free of charge from the moment it leaves the cab until stored away in the car, although many travelers "tip" them lightly for their service. American travelers should keep in mind that their luggage is never checked, and that they must invariably claim it the minute the destination is reached and it is ejected from the car. All the railways are owned by private corporations.

The Great Northern Railway.—This company has in operation 523 miles of railway lines (139 miles are double and 384 single track) and is the most important railway in the north of Ireland. Its termini are Dublin, Belfast, and Londonderry. Some of the principal towns which it touches are Lisburn, population, 14,000; Lurgan, 11,500; Portadown, 8,500; Armagh, 8,300; Monaghan, 3,000; Dungannon, 4,100, and Omagh, 4,300.

The ballast for the roadbed consists chiefly of gravel and sand; in some instances, in a soft or clayey soil, broken stone is used as a foundation for the ballast. The permament way or main line is at present being fitted with bull-head steel rails, weighing 75 pounds per yard, and 26 feet in length; these are laid in cast-iron chairs, weighing 37 pounds. Recently the directors ordered rails weighing 85 pounds per yard, having concluded that the others were too light. The sleepers are of Baltic redwood, creosoted, and measure 10 inches in width by 5 in thickness. The gauge of the road is 5 feet 3 inches, which is the uniform gauge throughout Ireland. In regard to the rolling stock, the larger engines for passenger trains have cylinders 17 by 24 inches, are worked by four wheels, the two hind ones being coupled, and the engine carried on a bogie in front. The freight engines are worked by three wheels on each side, the two hind ones being connected. The average steam pressure is about 140 pounds to the square inch. The latest passenger carriages of the first and second class are about 45 feet in length, divided into four compartments and fitted with lavatories. The first-class carriages are upholstered in melton cloth, except the smoking carriages, which are done in leather; the second class are done in a figured rep cloth; the third class are not generally upholstered, though some of them on the through trains have ordinary cushioned seats. Nearly all third-class carriages are divided into five compartments, each of which is intended to accommodate ten passengers, five on a side; when filled, they are too close for even ordinary comfort. The ordinary open freight cars carrying coal, etc., carry 8 to 10 tons, though some are now being used, manufactured on the American principle, which will carry 30 to 35 tons. The box cars average about 8 tons.

The distance between Belfast and Dublin is $112\frac{3}{4}$ miles. There are six trains daily between the two cities; the fastest train makes the run in $2\frac{1}{2}$ hours. The distance from Belfast to Londonderry by this route is $100\frac{1}{2}$ miles. There are five daily trains each way; the quickest time is $3\frac{1}{4}$ hours.

The total capital of this company, including its branches, is £8,321,955 ($40,494,633). The stock is held principally in Ireland. The average rate of dividends is $5\frac{3}{4}$ per cent. The rolling stock is made up by 137 engines, 313 passenger coaches, and 3,502 freight cars, or "goods wagons," as they are called here.

The steepest gradient on the main line of the Great Northern Railway is 1 in 100. On the branch lines the steepest gradient of any extent is 1 in 70, though in one or two instances, for distances of one-eighth to one-fourth of a mile, it is as high as 1 in 57 or 58. The sharpest curve on the main line is 1,650 feet radius, and on the branch lines 990 feet radius.

There are two tunnels on the line; one between Goraghwood and Lough Swilly, about 1 mile in length, and one near Dungannon about half a mile long. The boring of the tunnels is principally through clay and sand, with an occasional bed of rock.

The following from the general manager is in reply to my request for the information therein contained:

Statistics show that the number of passengers, exclusive of season ticket holders, and number of tons of freight conveyed over this line during the year 1893 were as follows: Passengers, 4,584,235; tons of freight, 898,933.

The passenger fare in Ireland is uniformly 4, 3, and 2 cents per mile for first, second, and third class, except in cases of excursions, when a considerable reduction may be made, sometimes amounting to more than one-half.

There seems to be no standard rate for carrying freight in this country. Each company is governed by the amount of competition with which it has to contend, either from opposition railways, ships, or canals. A distinction is in many cases made between the charge per mile in a long and short haul, but not a uniform one. A maximum rate per mile which may be charged is fixed by act of Parliament, but in very few cases does the actual charge reach the limit. The following rates on a number of articles, which include several classes of merchandise carried over the Great Northern Railway, between Belfast, Dublin, and Londonderry, may serve to give a general idea of the current charges:

Articles.	Belfast to Dublin.	Belfast to Londonderry.	Dublin to Londonderry.
Meats, tinned goods, and machinery in cases:			
Under 3 tons	$5.18	$5.59	$7.96
Over 3 tons	5.06	.....	7.84
Coal:			
Under 6 and not less than 4 tons	2.10	1.90	2.57
Over 6 tons	2.00	1.82	2.49
Machinery packed.....per ton	6.88	8.02	11.49
Furniture.....do	8.10	9.36	13.68
Dry goods:			
Under 3 tons	5.91	9.11	9.60
Over 3 tons	5.79	.....	9.48
Flour:			
Under 2 tons	3.85	*a* 2.83	6.52
Over 2 and under 5 tons	3.04	.....	4.23
Over 5 tons	2.67	.....	3.89

a Per single ton.

The following are exceptional rates at owner's risk. Owners to load and unload:

Articles.	Belfast to Dublin.	Belfast to Londonderry.	Dublin to Londonderry.
Flour:			
Under 5 tons.....per ton..	$3.34	*a*$1.46	$4.64
Over 5 tons.....do....	2.23	.....	3.04
Machinery.....do....	3.16	.....	.....
Coarse meats.....do....	3.04	.....	3.65
Dry goods.....do....	.....	4.86	.....
Preserves.....do....	.....	3.28	.....
Furniture (rough).....do....	.....	7.80	.....
Live stock:			
Per wagon.....	12.16	11.31	15.83
Per half wagon.....	8.26	6.68	12.34

a Per single ton.

Belfast and Northern Counties Railway.—This road has in operation 249 miles of railway, 33 of which are double track and 216 single. It is the second principal railway in the north of Ireland. Its principal termini are Belfast and Londonderry. Several of its branches extend to such important points as Larne, population, 5,378; Ballymena, 9,121; Port Rush, 4,000 in summer, 1,600 in winter; Cookstown, 4,831, and Coleraine, 6,708. The branch to Larne is a favorite route to points in Scotland and England. Larne has a good harbor and is but 39½ miles from Stranraer, Scotland. Swift steamers make the run across the North Channel in two and one-half hours, connecting with fast trains for Glasgow, Edinburgh, and London. Port Rush, 7 miles from the Giant's Causeway, is a favorite watering place. The "golf links" there are reputed to be among the best in the Kingdom and "golfers" from all sections are there in season enjoying the bracing atmosphere and their favorite pastime.

The rails used on this road weigh 83 pounds per yard, and the chairs 27 pounds each. The rolling stock of all descriptions is quite similar to that used on the Great Northern and other railways in this country, as the gauge is uniform and the general conditions of the roads much the same. The American style of freight cars has been tried on this line, but they do not seem to meet the demands of the shippers, as the shipments are small and distances short. There are in use on this line 65 engines, 280 passenger coaches, and 1,993 freight cars. The steepest gradient is 1 in 60, but this is only for a short distance, 1 in 80 being the heaviest for any considerable distance. The sharpest curve is 594 to 660 feet radius. There are two tunnels on the line, one 900 yards and the other 350 yards in length. The boring is entirely through rock. The capital of the company is £2,508,000 ($12,203,928). The majority of the shares is held in Ireland, but a considerable portion is held in England. The dividends for the last five years have averaged 5¼ per cent. The road is reported as working on a sound financial basis.

As no response has yet been received to my request for the amount of freight and passenger traffic on this line for the year 1893, I here-

with append the figures for 1892: Passengers, 2,520,317; tons of freight 625,486.

The Belfast and County Down Railway.—This road has in operation 76 miles of track—64 single and 12 double. Little or no "pitching" is used in the construction of the road, as it is principally over an undulating country, and the towns reached are mainly seaports and summer resorts. The rails used weigh 80 pounds per yard, and are set in 57-pound chairs. The rolling stock and general conditions are similar to those on the other lines. The total capital is £1,186,738 ($5,774,667), the stock being held principally in Belfast. The dividends for the last five years have averaged 6½ per cent. There are in use 26 engines, 141 passenger coaches, and 515 freight cars. There is no heavy work on the line, such as cuts, bridges, or tunnels, worth mentioning. The steepest gradient is 1 in 70, and the sharpest curve is 660 feet radius. The number of passengers carried during the year 1893 was 2,045,112, and the number of tons of freight 205,133.

HIGHWAYS.

Many travelers from the United States are accustomed to include England and Scotland in their itineraries, omitting Ireland, either because it is out of their way or they are indifferent to its attractions. This is a mistake; for the summer tourist in hunt of a cool, invigorating climate, or the student enlarging his scope of knowledge, will find it both pleasant and profitable to include as much of Ireland as he can in his journey abroad. It is replete with historic interest. The sanguinary wars of the Celtic chiefs or kings and their tribes, not only against each other but against the frequent invader, did much to destroy all traces of ancient architecture and written records, but enough of both remains to repay the student and antiquary.

The scenery from the railway carriage, the lively jaunting car, or on foot, is varied and often charming. Much of the country is undulating, with an occasional good-sized hill or group of them. There are no forests, but there are many beautiful groves and avenues of fine forest trees planted years ago. A goodly portion of the land is arable; much of it is in pasture, and such pasture I never saw outside of Ireland.

The highways are of the best—all macadamized, well drained, solid as a rock, and many of them nearly as smooth as a floor. When a hole, rent, or depression shows itself caretakers are promptly on the spot to repair the defect. The roads are usually bordered by abundant and thrifty hedgerows of hawthorn, beech, and privet, the foliage producing a most pleasing effect.

The principal highways vary in width, ranging from 16 to 35 feet. Some of them have footpaths on either side, made of gravel or fine broken stone, from 4 to 5 feet wide and raised several inches above the road. Nearly all the roads are well adapted for bicycling and pedestrian parties, as, in addition to being smooth, the grades are

light, and each succeeding year these methods of "doing" Ireland are growing in popularity. Cycling parties, particularly, are becoming more frequent.

There are in the city of Belfast about 150 miles of streets, of which about 10 miles are paved with stone sets 4 inches square, 50 miles macadamized, and 90 miles paved with sea pebbles. There is no uniform width in the streets. A street may be much narrower at one point than at another, and may not retain the same name for the whole of its length.

One of the main highways in this district leads from Belfast, around the coast of Antrim, to Londonderry. The principal point of interest on this road is the town and castle of Carrickfergus. The castle was built in the thirteenth century. It is still in a good state of repair, and is used as a Government fortress. It was here that King William landed his forces in 1690, and the stone (an immense block of basalt) on which the king landed is built into the old pier head, and is known as "King William's stepping-stone." Farther along the road may be seen Glenarm Castle, which is built upon a high cliff, and is now the property of Lord Londonderry. After passing through many quaint villages and hamlets, the Giant's Causeway, one of the wonderful natural rock formations of the world, is reached. A little farther on are the ruins of Dunluce Castle, which occupies a prominent place in the history of feudal times.

The old walled city of Londonderry, which successfully resisted the siege of King James in 1689, is a place of great interest. The walls still stand and are kept in an excellent state of repair. Among the old cannon mounted on the walls a historic gun known as "Roaring Meg" still remains in the same spot where it did such execution in defense of the city. Another important highway is the road leading to Downpatrick. Here there is to be seen a very pretty cathedral, which claims the honor of being built upon the site of the last resting place of St. Patrick, St. Bridget, and St. Columb. On the old highway from Belfast to Dublin, there is scarcely a town that has not some historical association.

Some of these points of interest may be noted, as follows:

Armagh, one of the most ancient towns in Ireland and the seat of an episcopal see founded by St. Patrick.

Bangor, a very ancient seaport town, 10 miles from Belfast. It is recorded that the first house built of stone and lime in Ireland was erected there. It was the chief seat of sanctity and learning of the ancient Irish Church. The height of its fame was attained during the sixth and seventh centuries. Learned missionaries set out from there for different parts of Europe to teach the Scripture. St. Comgal was the first abbot of the monastery, which at one time had 3,000 monks within its environs. This abbey was destroyed by the Danes in 821. Some of the ruins are still visible.

Coagh is situated about 4 miles from Cookstown. A battle took place at the ford of the small river on which it is situated in the year 1641, when the chapel of Tamlaght was destroyed by the Parliamentarians. James II crossed the river at this place on his march to the siege of Derry.

Donegal is situated at the mouth of the River Eske. It has two splendid ruins, one a castle in a fair state of preservation; the other an ancient abbey, founded for the Franciscan friars in the year 1474. There is said to be a subterranean passage one-fourth of a mile long between the castle and the abbey.

Dungannon is beautifully situated on a hill. It was the seat of the chiefs of the O'Neills from its earliest days, and on the hill crowning the town formerly stood a castle erected by those powerful chiefs.

Donaghmore, 2 miles from Dungannon, has an interesting ecclesiastical history. St. Patrick built a church here, where an old grave is now to be seen, and close to which is a fine specimen of the old Irish cross.

Garvagh, the scene of a battle in the year 1641 between Colonel Canning and Sir Phelim Roe O'Neill. Colonel Canning's forces were defeated and himself killed. It is reputed to be one of the prettiest towns in Ireland.

Hillsboro is the seat of the Marquis of Downshire. Hillsboro Fort, often visited by tourists, was built in the reign of Charles I and is constituted a royal fort, of which the Marquis of Downshire is hereditary constable. King William stopped here when passing on to the Boyne, and it was here he signed the Regium Donum grant to Presbyterian ministers.

Holywood is about 4 miles from Belfast. The highroad passes over Bunkers Hill, from which the American "Bunker Hill" is named. King John halted here on his march from Carrickfergus to Downpatrick in the year 1210. About the year 1200 a monastery of the third order of Franciscans was established and tenanted by 400 monks.

Larne.—Near the harbor may be seen the ruins of Olderfleet Castle, which was once an important defensive fortress. It was there that Edward Bruce landed with his band of Scots when he undertook to free Ireland from English rule in the year 1315.

Limavady is a town of great antiquity. It was the seat of the celebrated O'Cahan, who was chief of one of those powerful "septs" of Ulster that were so constant and determined in their opposition to the English from the year in which Sir John De Courcy received the province from the Plantaganets till the day they were finally subdued under the first of the Stuarts. There are numerous places of interest, including the remains of an ancient castle.

Newry is a very ancient town. In the year 1175 Maurice McLaughlin, King of Ireland, founded an abbey here, to which great immunities and endowments were granted and afterwards confirmed by Hugh De Lacy, Earl of Ulster, in 1237. In 1689 the Duke of Berwick set fire to the place and left it in a ruined condition.

Newtownards.—A most interesting ecclesiastical ruin may be seen near the town, where, in the old cemetery of Magh Bile, stand the remains of an abbey said to have been founded by St. Finian in the year 550. Several monumental tablets, one of the oldest bearing an Irish inscription, may be seen built against the north wall.

Raphoe is a small town 12 miles from Londonderry. The Cathedral of St. Eunan, which is now the parish church, was founded in the year 565, is one of the oldest in Ireland, and contains many interesting specimens of ancient architecture.

OCEAN LINES.

The following are the principal lines of steamships sailing from this port:

The Lord Line.—This line is owned and controlled by the Irish Shipowners Company. There are six boats on the line which carry breadstuffs and miscellaneous cargoes between this port and Baltimore. They carry no passengers. Four of the steamers are of steel and two of iron. There are periodical sailings at intervals of about two weeks. There is no fixed schedule of freight rates. They vary according to the nature of the goods and the condition of trade.

The Head Line.—This line is managed by G. Heyn & Sons, of this city, and consists of nine steel screw steamers. Some of these vessels have recently commenced regular sailings between this port and Montreal. The remainder ply between British and colonial and foreign ports. The latest addition to the fleet is the *Torr Head*, a twin screw steel vessel of 3,867 tons. In the matter of freight rates, the same conditions obtain as on the Lord Line.

The Liverpool Line.—This line is owned by the Belfast Steamship Company. There are five steel screw steamers on the line. The *Magic* is a newly constructed steamer, built by Harland & Wolff, of this city, and is the best equipped and finest steamer of the fleet. She is a steel twin screw steamer (as are all the others on the line), and has a net tonnage of 1,750. There are daily sailings between this port and Liverpool. The journey, a distance of 135 miles, is accomplished in about ten hours, and a large proportion of the passengers and freight between the north of Ireland and England is carried by this route. The passenger fares between the two ports are: Saloon, $3.04; steerage, $1.21; which includes berth, but not meals. The freight rates are very low at present, as competition is keen. They vary from 60 cents to $3.65 per ton, according to the nature of the goods.

The Fleetwood Line.—This line is owned by and runs in connection with the Lancashire and Yorkshire and London and Northwestern Railway companies of England, and consists of five steel screw steamers. There are daily sailings between Belfast and Fleetwood. The London trains make connection with the boats at Fleetwood, and run alongside of them, the passengers being able to make the crossing from boat to train

by a covered passage. The passenger fares and freight rates are the same as to Liverpool, as the two are competing lines.

The Glasgow Line.—This line is owned by the Clyde Shipping Company of Glasgow and has seven boats in operation, which ply daily between Glasgow and Belfast. During the summer months there are two sailing each day, one by daylight and the other by night. The passenger fares are: Saloon, $3.04; and steerage, 97 cents. The freight rates are somewhat higher than between this and English ports. ranging from $1.21 to $4.86 per ton.

At the present writing, the rates are very much demoralized, and it is quite difficult to get a paying charter for "tramp" steamers. In fact, ocean traffic is so dull that many steamships are laid up for want of business, and owners in many instances are selling their vessels at great sacrifices, whenever they can get purchasers, in order to save the expense of caring for them while not in use. Steamship builders report orders scarce and competition for what is going exceedingly keen and close.

The following table, taken from Lloyd's Register, gives the name, tonnage, horsepower of engines, size of cylinders, length of stroke, boiler pressure and condition, wherever same was specified, of all the steamers on the above lines:

Name of steamer.	Tonnage.	Horse-power.	Cylinders.	Stroke.	Pressure.
Clyde Shipping Company:					
Alligator	985	280	38½ and 69	48	.....
Dromedary	975	280	38½ and 69	48	.....
Gorilla	982	280	38½ and 69	48	.....
Hare	771	210	24, 38, and 58	42	140
Hound	1,061	350	.....	.....	.....
Grampus	698	180	36 and 64	36	.....
Seal	691	180	36 and 64	36	.....
Belfast Steamship Company:					
Magic	1,750	.....	.....	.....	.....
Caloric	1,748	170	18, 29, and 46	39	160
Mystic	726	219	.....	.....	.....
Optic	971	200	35 and 70	45	.....
Dynamic	937	200	35 and 70	45	100
Irish Shipowners Company:					
Lord Londonderry	2,409	240	23, 37, and 60	42	160
Lord Erne	5,610	418	.....	.....	.....
Lord Charlemont	3,138	320	24½, 37, and 64	48	160
Lord Bangor	2,991	300	24, 39, and 64	45	150
Lord O'Neill	2,751	350	37 and 72	45	90
Lord Landsowne	2,753	350	37 and 72	45	90
Lord Templemore, Lord Wolseley, and Lord Templeton *a*	.....	.....	.....	.....	.....
Belfast and Fleetwood Line:					
Duke of York	3,026	220	.....	.....	.....
Duke of Clarence	1,489	500	.....	.....	.....
Prince of Wales	1,563	518	43 and 77	84	.....
Earl of Ulster	1,165	350	34 and 64	72	.....
Princess of Wales	1,144	280	32 and 56	78	.....
Head Line:					
Torr Head	.....	.....	.....	.....	.....
Runmore Head	4,444	450	26½, 44, and 72	51	175
Innishowen Head	3,050	320	24½, 37, and 64	48	160
Bengore Head	2,490	275	34 and 68	45	90
Dunmore Head	2,230	275	22, 36, and 60	42	170
Teelin Head	1,668	200	31 and 60	42	85
Black Head	1,145	140	28 and 53	38	75
White Head	1,145	140	28 and 53	38	75
Fair Head	1,132	120	27 and 51	38	70

a Not registered in Lloyd's.

COAST LINES.

Besides the principal lines of steamships, there are daily sailings between this port and Barrow and Ardrossan and triweekly to Ayr. The boats carry freight and passengers. The freight and passenger rates are in proportion with the other lines. There is also a biweekly service to Dublin, Plymouth, Bristol, and London, and weekly to Cork, Cardiff, Waterford, and Southampton, but there is little accommodation for passengers on these boats. During the summer months, there is a daily excursion steamer to the Isle of Man and frequent daily excursion sailings to summer resorts along the coast.

CANALS.

There are three small canals in this district, which now all run in connection with each other and are owned by the same company. They are altogether 74½ miles in length, and are connected with Loughs Neagh and Erne. Considerable quantities of coal, timber, slates, brick, and other heavy merchandise are carried up the country by this route. The canal boats, or lighters as they are called here, are owned by private individuals who pay toll to the company.

JAMES B. TANEY,
Consul.

BELFAST, *June 25, 1894.*

BELGIUM.

SITUATION AND BUSINESS OF ANTWERP.

While the railroad facilities of the province and city of Antwerp are quite sufficient for all purposes of inland travel and trade, it is as a port that the city of Antwerp invites most attention.

Antwerp is situated about 50 miles from the North Sea on the right bank of the River Scheldt, a river with the usual variations of tide, and navigable by ocean vessels of large size and tonnage.

Before detailing the various lines of ocean vessels coming into the port of Antwerp, a general idea of the volume of business is given in the following table, showing the number of arrivals and the total tonnage of the vessels during the last ten years:

Year.	Number of vessels.	Total tonnage.	Average tonnage per vessel.	Year.	Number of vessels.	Total tonnage.	Average tonnage per vessel.
1885	4,860	3,492,934	719	1890	4,532	4,517,698	999
1886	4,726	3,521,229	745	1891	4,461	4,693,238	1,052
1887	5,022	3,801,952	755	1892	4,321	4,500,091	1,042
1888	4,823	3,974,320	824	1893	4,418	4,692,211	1,062
1889	4,356	4,050,549	930	1894	4,640	5,008,983	1,080

The arrivals for the year 1894, according to nationality, were.

Flag.	Number of vessels.	Total tonnage.	Flag.	Number of vessels.	Total tonnage.
Austrian	12	19,339	Norwegian	259	147,327
Belgian	309	425,686	Portuguese	12	7,100
Danish	168	130,822	Russian	41	28,452
British	2,611	2,817,388	Spanish	46	38,859
French	125	111,133	Swedish	160	91,517
German	719	971,428	American	23	47,281
Greek	26	45,939			
Dutch	101	103,485	Total	4,640	5 008,983
Italian	28	23,117			

OCEAN LINES.

Red Star Line.—Among the ocean lines from Antwerp, the first in importance, at least so far as concerns business between Antwerp and the United States, is the Red Star Line, a private corporation, the majority of the stock of which is owned by citizens of the United States. All the steamers except two, the *Pennsylvania* and the *Illinois*, fly the Belgian flag. These two are under the American flag. The terminal points are Antwerp and New York and Antwerp and Philadelphia. The New York service is weekly (sometimes semiweekly), and carries first, second, and third class passengers; also, mail and freight. The Philadelphia service is fortnightly, and carries third-class passengers and freight.

The distance between Antwerp and New York is 3,344 miles and between Antwerp and Philadelphia 3,408 miles.

The rates for first-class passengers vary according to the steamer chosen, the season of the year, or the number of passengers occupying a stateroom, from $65 to $210 per person in the summer (between August 1 and October 15), and from $60 to $95 per person at other seasons of the year. A reduction of 15 per cent, each way, is allowed on all round-trip tickets, and these tickets are available for one year.

It is very difficult to answer with accuracy the inquiry as to rates of freight. The manager of the freight department informs me that the freight charges differ with different articles, and charges for the same article vary with the fluctuations in the freight market, which depend upon competition, the size of the cargo, the size of the shipment, and other causes. So far as a rule can be given, it may be said that the average charge, both to New York and Philadelphia, for heavy articles (those whose rate is determined by weight) is $1.50 per ton; while for light articles (those whose rate is determined by the space occupied) the charge is $5, and 10 per cent additional, per 40 cubic feet.

The fleet of the Red Star Line consists of the following steamers:

Name.	Tonnage.	Name.	Tonnage.
Friesland	7,116	Rhynland	3,689
Westernland	5,736	Nederland	2,839
Voordland	5,212	Switzerland	2,816
Waesland	4,752	Pennsylvania	3,166
Pennland	3,760	Illinois	3,126
Belgenland	3,692		

All of the forgoing steamers are employed in the New York service, except the last three, which go to Philadelphia.

The Red Star Line keeps its ships in good condition. Besides the habitual inspection, cleaning, repairing, and painting, which occur at the end of every voyage, each steamer is put twice a year in the dry dock of the company, situated here, when the bottom is scraped and painted, and the steamer otherwise subjected to a thorough inspection and overhauling.

The *Friesland*, *Noordland*, and *Westernland* are built of steel; all the others of iron. The *Friesland*, *Waesland*, *Illinois*, and *Pennsylvania* have triple expansion, the others have compound engines; all are compartment steamers. The Antwerp, and general European agents of the Red Star line are Vonder Becke & Marsily.

North German Lloyd.—This line has, it is said, the largest fleet in the world; it consists of seventy-two vessels, and five more are now being built. Of these, forty have a tonnage of over 2,300, and twenty-six a tonnage, of over 4,500. The largest is the *Kaiser Wilhelm II*, tonnage, 6,991, closely followed by the *Spree*, *Havel*, and *Prince Regent Luitpold*, with tonnages of 6,963, 6,963, and 6,700, respectively.

The North German Lloyd Company is a private German corporation, with head offices in Bremen. It is engaged in the North and South American, the East Indian, Chinese, and Australian trade, and thus divides itself into distinct branches. All the ships start from Bremen.

There are four branches of the line which touch at Antwerp, and to these only, will reference be made. They will be distinguished by use of the terminal points, and are as follows:

(1) Bremen-Shanghai branch.—The steamers in this service, starting from Bremen, touch at Antwerp, Southampton, Genoa, Naples, Port Said, Aden, Colombo, Singapore, Hongkong, and stop at Shanghai. Prompt connection is made at Hongkong for the Japanese ports of Yokohama, Hiogo, and Nagasaki.

(2) Bremen-Sydney branch.—Starting at Bremen, calls are made at Antwerp, Southampton, Genoa, Naples, Port Said, Aden, Colombo, Adelaide, Melbourne, with Sydney as the terminus.

(3) Bremen-Santos branch.—Leaving Bremen, the steamers stop at Antwerp, Corunna, Bahia, Rio Janeiro, and finally, at Santos.

(4) Bremen-Buenos Ayres branch.—Starting from Bremen, stops are made at Antwerp, Lisbon, Montevideo, and Buenos Ayres, the terminus.

All of these branches carry first, second, and third class passengers; also mail and freight, and make monthly trips. The distances from Antwerp are:

To—	Miles.	To—	Miles.
Southampton	244	Adelaide	11,690
Genoa	2,378	Melbourne	12,175
Naples	2,714	Sydney	12,825
Port Said	3,824	Lisbon	1,120
Suez	3,911	Corunna	760
Aden	5,219	Bahia	4,680
Colombo	7,312	Rio Janeiro	5,400
Singapore	8,882	Santos	5,590
Hongkong	10,319	Montevideo	6,260
Shanghai	11,189	Buenos Ayres	6,375

Rates for first-class passengers from Antwerp are approximately as follows:

To—	Fare.	To—	Fare.
Genoa	$43.75	Melbourne	$316.25
Naples	58.75	Sydney	325.00
Port Said	87.50	Cornhna	25.00
Singapore	325.00	Montevideo	150.00
Hongkong	354.00	Buenos Ayres	150.00
Shanghai	380.00	Rio Janeiro	137.50
Adelaide	287.50		

The inquiry as to the rates of freight is even more difficult to answer in connection with the North German Lloyd than with the Red Star Line, because there are so many ports of call, and consequently, so many different rates. It will be remembered also that (1) there are many classes of freight, as "first class," "third class," "dead weight," "munitions of war," etc.; (2) that the freight rates are constantly fluctuating; and (3) most important, that the rates for all large commercial transactions are usually determined by special agreement between the shipper and the company.

As there are so many vessels belonging to the North German Lloyd fleet, those engaged in the Antwerp trade, as above described, are often changed, but the ones usually coming to this port are:

Name.	Tonnage.	Name.	Tonnage.
Bayer	5,343	Dresden	4,802
Sachse	5,343	Munche	4,801
Preussen	4,645	Weser	2,823
Prince Regent Luitpold	6,700	Kolb	2,556
Braunschweig	3,173	Graf Bismarck	2,406

The Antwerp agents of the North German Lloyd Company are H. Albert de Bary & Co.

Peninsular and Oriental Steam Navigation Company.—This company, having a fleet of fifty ships, is a private English corporation, with head

offices in London. Ten of its steamers are engaged in the Antwerp trade as follows:

Name.	Tonnage.	Name.	Tonnage.
Aden	3,925	Japan	4,319
Bombay	3,216	Java	4,093
Canton	3,171	Malacca	4,045
Ceylon	4,094	Manila	4,210
Formosa	4,045	Shanghai	3,216

These are divided between two branches, which, indicated by the terminal points, are:

(1) Antwerp-Yokohama branch, touching at London, Gibraltar, Genoa, Naples, Malta, Brindisi, Port Said, Aden, Colombo, Singapore, Hongkong, Nagasaki, Hiogo, and Yokohama. Prompt connection is made at Aden for Bombay; at Colombo, for Madras and Calcutta, and at Hongkong, for Shanghai. The service is monthly.

(2) Antwerp-Sydney branch, calling at London, Gibraltar, Mediterranean ports, Port Said, Aden, Colombo, Albany, Adelaide, Melbourne, and Sydney. The service is monthly.

Besides freight, first and second class passengers are carried by both services, and mail is taken at London and Brindisi.

The distances and rates are about the same as those of the North German Lloyd Company, as the routes are almost identical.

The Antwerp agents are John P. Best & Co.

Union Steamship Company.—This is a private English corporation, with head offices in London. The line is engaged in the South African trade, and has Southampton for its English port of departure. From Southampton the service is weekly. The Antwerp service is monthly, and carries first, second, and third class passengers, freight and mail.

The steamers in the Antwerp service are often changed, but one of the following is usually employed:

Name.	Tonnage.	Name.	Tonnage.
Guelph	4,916	Trojan	3,471
Greek	4,747	Spartan	3,403
Gaul	4,744	Pretoria	3,198
Goth	4,738	Arab	3,192

The ports touched are Lisbon, Madeira, Teneriffe, Ascension, St. Helena, Cape Town, Mossel Bay, Knysna, Port Elizabeth, East London, Durban (Natal), Delagoa Bay, Mozambique, and Zanzibar. Calls at the smaller places are not made every trip, unless necessary to unload freight or passengers. Durban is the terminal port of the mail steamers, but other steamers of the same company proceed to Zanzibar once a month, stopping at intermediate points.

The distances from Antwerp are:

To—	Miles.	To—	Miles.
Southampton	244	Knysna	6,691
Lisbon	1,120	Port Elizabeth	6,836
Madeira	1,637	East London	6,963
Teneriffe	1,896	Durban	7,221
St. Helena	4,698	Delagoa Bay	7,514
Cape Town	6,398	Mozambique	8,441
Mossel Bay	6,644	Zanzibar	9,101

The rates for first-class passengers from Antwerp to the places mentioned are:

To—	Fare.	To—	Fare.
Lisbon	$45.90	Knysna	$198.90
Madeira	66.30	Port Elizabeth	198.90
Teneriffe	71.40	East London	204.00
St. Helena	183.60	Durban	209.10
Ascension	153.00	Delagoa Bay	219.30
Cape Town	183.60	Mozambique	255.00
Mossel Bay	198.90	Zanzibar	255.00

The Antwerp agents are John P. Best & Co.

Compagnie Belge Maritime du Congo.—This is a private Belgian corporation engaged in trade with that part of the West African Congo territory known as the Belgian Congo. The service is monthly, and carries first and second class passengers, freight and mail. The sailing date at Antwerp is the 6th of each month, and the rate for first-class passengers is $160.

There are only three steamers engaged in this service, namely: *Leopoldville*, 3,460 tons; *Coomassie*, 2,902 tons; *Eduard Bohlen*, 2,367 tons.

The Antwerp agents are John P. Best & Co.

Kosmos Line.—This is a private German corporation, with Hamburg as the port of departure, engaged in the Chilean and Peruvian trade. The points touched are Antwerp, Falkland Islands, Punta Arenas, Corral, Coronel, Talcahuano, Valparaiso, Antofagasta, Iquique, Arica, Mollendo, Pisco, and Callao.

The service is fortnightly, and carries first, second, and third class passengers, freight, and mail.

The steamers are all compartment ships of steel or iron, and are:

Name.	Tonnage.	Name.	Tonnage.
Herodot	2,848	Ramses	3,634
Isis	2,645	Serapis	2,706
Kambysis	1,824	Tanis	3,033
Memphis	3,873	Theben	1,686
Menes	1,714	Thotmes	1,808
Osiris	2,638	Luxor	3,900
Pentaur	2,803	Hathor	3,900

The distances from Antwerp are:

To—	Miles.	To—	Miles.
Falkland Islands	7,350	Antofagasta	9,986
Punta Arenas	7,910	Iquique	10,216
Corral	8.950	Arica	10,318
Coronel	9.140	Mollendo	10,453
Talcahuano	9,176	Pisco	10,773
Valparaiso	9.406	Callao	10,989

The rates for first-class passengers from Antwerp are: To Falkland Islands, $195; Punta Arenas, $225; all remaining intermediate points and to Callao, $300.

The Antwerp agents are August Bulcke & Co.

Puritan Line.—This is a private English corporation, which conducts a first-class freight business between Antwerp and Boston, and between Antwerp and Baltimore, once a month from each port.

The steamers engaged in this service are:

Name.	Tonnage.	Name.	Tonnage.
Storm King	3,279	Belgian King	3,354
Norse King	2,985	Otranto	2,379

The Antwerp agents are Thomas Ronaldson & Co.

Wilson Line.—This is a private English corporation, and runs a fortnightly freight service between Antwerp and New York. The steamers, together with their tonnage, are:

Name.	Tonnage.	Name.	Tonnage.
Marengo	2,273	Othello	2,479
Lepanto	2,287	Rialto	2,229

The Antwerp agents are August Bulcke & Co.

San Francisco Line.—This line runs sailing vessels of the first class monthly to the western coast of the United States. The ships carry only freight, grain in bulk for the most part. They touch at San Diego, Redondo, San Francisco, Portland, Port Townsend, Everett, Seattle, and Tacoma.

The Antwerp agents are John P. Best & Co.

Hamburg-Pacific Steamship Company.—This is a private German corporation, and runs a steamer regularly every fifteen or twenty days to the western coast of South and Central America. It carries first-class passengers and freight. The steamers call at the same ports as the Kosmos Line as far as Callao, and beyond Callao they call at Salaverry, Payta, Manta, Guayaquil, Punta Arenas (in Costa Rica) Corinto, San Juan del Sur, La Union, Amapala, La Libertad, Acajutla, San Jose de Guatemala, and stop at Champerico.

The steamers generally employed in the Antwerp service, together with their tonnage, are:

Name.	Tonnage.	Name.	Tonnage.
Adriana	4,500	Valeria	3,500
Delia	5,000	Miranda	4,000
Volumnia	5,000	Modestia	5,000
Lavinia	3,000		

The Antwerp agents are Grisar & Marsily.

Prince Line.—This is a private English corporation, and runs a monthly service for first, second, and third class passengers, and freight from Antwerp to Rosario, touching at London, Montevideo, and Buenos Ayres. The rate for first-class passengers is $5 per day.

The steamers, together with their tonnage, are:

Name.	Tonnage.	Name.	Tonnage.
Asturian Prince	3,147	Afghan Prince	3,263
Italian Prince	3,083	Tartar Prince	3,263

The Antwerp agents are August Bulcke & Co.

Cork Steamship Company.—This is a private Irish corporation, and runs three services, as follows: Antwerp to Liverpool; Antwerp to Manchester, and Antwerp to Glasgow. Each service is weekly, and carries first-class passengers and freight. The rate for first-class passengers is $5.50 from Antwerp to each of the termini.

The steamers engaged in these services are of steel and iron, and, together with their tonnage, are:

Name.	Tonnage.	Name.	Tonnage.
Egret	1,234	Bittern	972
Ptarmagan	1,234	Moorhen	1,756
Avocet	1,097	Ousel	816
Rallus	1,040	Whimbrel	649
Ibis	1,585		

The Antwerp agents are John P. Best & Co.

It will be observed that the lines given have been selected with a view to showing the connections of Antwerp with all parts of the world, and also because of the importance of the lines themselves. The remaining lines, therefore, will not be described with the same detail. They are:

Hansa Line.—Service monthly, for passengers and freight; destination, the ports of Brazil and of the Argentine Republic. Antwerp agents, Selb & Huverstuhl.

Bossières Bros. of Havre.—Service monthly, for freight; destination, ports of Canada. Antwerp agent, D. Steinmann-Haghe.

Ross Line.—Service monthly, for freight; destination, ports of Canada. Antwerp agents, Thos. Ronaldson & Co.

White Cross Line.—Service monthly, for freight; destination, Boston and New York. Antwerp agents, Steinmann & Co.

New Orleans Line.—Service monthly, for freight; destination, New Orleans. Antwerp agents, Kennedy, Hunter & Co.

Cuban Line.—Service monthly, for passengers and freight; destination, Porto Rico and Cuba. Antwerp agent, D. Steinmann-Haghe.

Compagnie Générale Transatlantique.—Service monthly, for passengers and freight; destination, Havana and Mexican ports. Antwerp agent, A. Deppe.

La Flecha Navigation Company.—Service monthly, for passengers and freight; destination, Havana. Antwerp agents, Walford, de Baerdemaeker & Co.

Serra Line.—Service monthly, for passengers and freight; destination, Havana. Antwerp agents, Walford, de Baerdemaeker & Co.

West India Steam Navigation Company.—Service monthly, for freight; destination, Vera Cruz and other Mexican ports. Antwerp agents, Kennedy, Hunter & Co.

Bossières Bros.—Service monthly, for passengers and freight; destination, Martinique, Guadaloupe, and Venezuelan ports. Antwerp agent, D. Steinmann-Haghe.

Lamport & Holt Line.—Service monthly, for first, second, and third class passengers, freight, and mail; destination, the ports of Brazil. Antwerp agents, Kennedy, Hunter & Co.

Lamport & Holt Line.—Service fortnightly, for passengers, freight, and mail; destination, Montevideo, Buenos Ayres, and Rosario. Antwerp agents, Kennedy, Hunter & Co.

Royal Mail Steam Packet Company.—Service monthly, for passengers and freight; destination, the ports of Brazil and of the Argentine Republic. Antwerp agents, Ch. Huger & Co.

Antwerp and London-Brazil Line.—Service fortnightly, for passengers and freight; destination, Rio Janeiro and Santos. Antwerp agents, Ruys & Co.

Macandrews & Co., London.—Service monthly, for freight; destination, Montevideo, Buenos Ayres, Boca, and Rosario. Antwerp agents, Walford, de Baerdemaeker & Co.

Gellatly, Hankey, Sewell & Co. Line.—Service every ten days, for freight; destination, Montevideo, Buenos Ayres, Boca, and Rosario. Antwerp agents, Gellatly, Hankey, Sewell & Co.

Antwerp-Chile Line.—A line of first-class sailing vessels; with a monthly service for freight; destination, the ports of Chile. Antwerp agents, Ruys & Co.

Atlas Line.—Service monthly, for freight; destination, the ports of Portugal and of Morocco. Antwerp agent, A. Blumenthal.

Mersey Steamship Company.—Service fortnightly, for freight; destination, Gibraltar, the ports of Morocco, and the Canary and Madeira islands. Antwerp agents, W. H. Müller & Co.

British India Steam Navigation Company.—Service monthly, for passengers and freight; destination, the eastern coast of Africa, as far as Zanzibar. Also, service monthly, for passengers and freight; destination, Bombay and Kurrachee. Antwerp agents, Gellatley, Hankey, Sewell & Co.

Hansa Line.—Service monthly, for passengers and freight; destination, Bombay, Madras, and Calcutta. Antwerp agents, Selb & Huverstuhl.

Hamburg-Calcutta Line.—Service monthly, for passengers and freight; destination, Madras and Calcutta. Antwerp agents, Grisar & Marsily.

Union Line.—Service monthly, for passengers and freight; destination, Penang, Singapore, Hongkong, Shanghai, Yokohama, and Hiogo. Antwerp agents, Eiffe & Co.

China Shippers Mutual Steam Navigation Company.—Service monthly, for passengers and freight; destination, the ports of China and Japan. Antwerp agents, Walford, de Baerdemaeker & Co.

Shire Line.—Service fortnightly, for passengers and freight; destination, the ports of China and Japan. Antwerp agents, Selb & Huverstuhl.

Glen Line.—Service monthly, for freight; destination, the ports of China and Japan. Antwerp agents, Ruys & Co.

Anglo-Australasian Company.—Service monthly, for freight; destination, the ports of Australia. Antwerp agents, Kennedy, Hunter & Co.

Antwerp European lines.—In addition to the foregoing lines, there are about sixty others engaged in the trade between Antwerp and other European ports. The majority of these lines, going to England, Denmark, Sweden, and Russia, carry first-class passengers in addition to freight; but those going to ports of France, Germany, Holland, Italy, Spain, Portugal, and Turkey do not, as a rule, carry first-class passengers because the railroad traveling is much quicker. The following are some of these lines, the terminal points in most cases alone being given:

Antwerp to London, Antwerp to Grimsby, Antwerp to Leith, Antwerp to Hull, Antwerp to Newcastle, Antwerp to Plymouth, Antwerp to Bristol, Antwerp to Liverpool, Antwerp to Glasgow, Antwerp to Gloucester, Antwerp to Dublin, Antwerp to Belfast, Antwerp to Rotterdam, Antwerp to Amsterdam, Antwerp to Mannheim, up the River Rhine, Antwerp to Hamburg, Antwerp to Stettin, Antwerp to Dantzig, Antwerp to St. Petersburg, Antwerp to Riga, Antwerp to Copenhagen, Antwerp to Stockholm, Antwerp to Christiania, Arendal, and Christiansand, Antwerp to Bordeaux, Antwerp to Havre; Antwerp to Havre, the ports of Spain and Portugal, and Marseilles; Antwerp to Marseilles and Genoa; Antwerp to Rotterdam, Marseilles, and Leghorn; Antwerp to the ports of the Adriatic Sea as far as Trieste; Antwerp to

Constantinople, Batoum, Sebastopol, and Odessa; Antwerp to the ports of the Black Sea; Antwerp to Alexandria, Smyrna, and Constantinople; Antwerp to the Sicilian ports; Antwerp to Harwick.

The Antwerp-Harwick is a high-class line, and runs a daily service for first and second class passengers. The passage is made in twelve hours, and the run from Harwick to London occupies two hours. The steamers are all of iron or steel, are very comfortable and are much patronized.

The Ostend-Dover line, although the steamers do not come to Antwerp, is owned by the Belgian Government. It runs three services daily, and the passage is made in three hours. The steamers carry, in addition to first and second class passengers, the continental mail.

RAILROADS AND WATERWAYS.

The railroad facilities in the consular district of Antwerp, and in all of Belgium as well, are of the first order. A large majority of the lines are owned by the Government, and all of them are under Government control. The administration and direction of the railroads, together with that of the post and telegraph offices, constitutes a special and distinct branch of the national ministry or cabinet, the chief officer of which holds the title of minister of railways, posts and telegraphs.

All the principal lines have double tracks, among which may be mentioned the following:

(1) Antwerp to Rosendael, Rotterdam, The Hague, Amsterdam and points beyond.

(2) Antwerp to Malines, Brussels, Mons, Paris and points beyond.

(3) Antwerp to Malines, Lourain, Liege, Verviers, Aix-la-Chapelle, Cologne and points beyond.

(4) Antwerp to Termonde, Ghent, Bruges, and Ostend.

(5) Antwerp to Ghent, Lille and points beyond.

The rates for passengers can be seen from the following table:

Trains.	Class.	Rate per mile.	Trains.	Class.	Rate per mile.
Express trains:		*Cents.*	Ordinary passenger trains:		*Cents.*
Single-trip tickets.....	First.....	3	Single-trip tickets.....	First.....	$2\frac{1}{2}$
	Second....	$2\frac{1}{4}$		Second....	$1\frac{7}{8}$
	Third.....	$1\frac{1}{2}$		Third.....	$1\frac{1}{4}$
Round-trip tickets	First	$2\frac{3}{5}$	Round-trip tickets....	First.....	2
	Second....	$1\frac{4}{5}$		Second....	$1\frac{1}{2}$
	Third.....	$1\frac{1}{5}$		Third.....	1

Freight in Belgium is transported more by water than by rail. In fact, practically all heavy freight, such as iron, cement, hides, grain, lumber, cotton, etc., is transported by water.

Belgium is traversed by two large rivers, the Scheldt and the Meuse, and by several small ones, chief among which are the Rupel and the Sambre. Almost all are navigable. To these, may be added a number of canals, most of which are narrow, but navigable for small boats,

which are usually drawn by horses or persons on the banks, or by small steam tugs.

There is navigable water connection between Antwerp and Brussels, Liege, Ghent, Bruges, Lourain, Mons, Charleroi, Namur, Tournai, and other places.

The freight charges are very light, varying with the season, the amount of freight, the kind or class, etc.

The basis, however, is from 1 to 4 francs (19.3 to 77.2 cents) per ton, according to the distance.

HARVEY JOHNSON,
Consul.

ANTWERP, *March 26, 1895.*

HOLLAND.

RAILWAYS.

There are two main steam railways in the Netherlands, viz: The Staatsspoorweg (State railway) and the Hollandsche Yzeren Spoorweg (Dutch railway). The former was built by the Government and leased for a period of years to a private corporation known as the Maatschappij tot Exploitatie van Staatsspoorwegen; the latter was constructed and is controlled by a private corporation known as the Hollandsche Yzeren Spoorweg Maatschappy. Both corporations are under the supervision of a board of survey, under the minister of marine, commerce and industry. The members of this board are appointed by the Queen to secure the safety of traffic. They are also under the supervision of a Government commissioner and assistant commissioner appointed by the Queen to control the finances.

State Railway (Staatsspoorweg.)—The Staatsspoorweg, headquarters at Utrecht, on the 1st of January, 1894, controlled 1,055.7 miles of railway. The rolling stock consists of 447 engines, 1,699 passenger and luggage vans, and 7,520 freight cars.

In 1893, 5,584,939 tons of goods were carried over the whole line, at the average rate of 61½ cents (American) per ton.

As highways of commerce, the following lines are to be considered: Amsterdam, Emmerich and Rotterdam, and Utrecht and Arnhem, with direct trains and Pullman car trains to and from Germany. The part of this line which was first opened is that from Amsterdam to Utrecht (on the 28th day of December, 1843). Communication with Arnhem was established in 1845. The Rotterdam branch to Utrecht was finished in 1855. In 1856, the German frontier was reached, and through communication established with the German State Railway at Emmerich. The length is: Amsterdam to Utrecht, 21.7 miles; Rotterdam to Utrecht, 32.9 miles; Utrecht to Emmerich, 54.7 miles; total, 109.3 miles.

The principal bridge is the Rhine bridge, near Westervoort, 843 feet in length.

The first-class passenger fares are: Amsterdam to Utrecht, 72 cents; Arnhem, $1.60; Emmerich, $2.14. Rotterdam to Utrecht, $1; Arnhem, $1.80; Emmerich, $2.40.

The daily average number of trains running between Amsterdam (Rotterdam branch included) and Emmerich is: Pullman car trains, 2; express trains, 14; slow trains, 8; goods trains, 12.

(2) The route from Amsterdam to Utrecht, Tilburg, Breda, Rosendael, and Eschen (Belgian frontier), is the highway of commerce between Amsterdam and Brussels and Paris. For passenger traffic, through trains—Amsterdam to Paris—are run, carrying sleeping cars. In 1855, Breda was connected by rail with the Belgian frontier, via Rosendael. In 1863, the line from Tilburg to Breda was finished; in 1870, that from Utrecht to Bois le Duc; in 1881, the Tilburg Bois le Duc portion was opened. The length of this line is as follows: Amsterdam to Utrecht, 21.7 miles; Utrecht to Bois le Duc, 30.4; Bois le Duc to Tilburg, 14.3; Tilburg to Breda, 13; Breda to Rosendael, 15.6, and Rosendael to Eschen, 5; a total of 100 miles.

The principal bridges on these lines are: Lek bridge, near Culemborg, 2,181 feet long; Waal bridge, near Zalt Bommel, 2,857 feet; and Maasbridge, near Hedel, 2,345 feet.

The first-class passenger rates from Amsterdam are: Utrecht, $2.72; to Bois-le-Duc, $1.50; to Breda, $2.08; to Rosen dael, $2.30; to Eschen, $2.90.

Eight express trains, 10 slow trains, and 12 freight trains are operated on these lines.

(3) Line from Flushing to Rosendael, Breda, Bokstel, Eindhovan, and Venlo (German frontier.) At Flushing through communication with England is obtained by the royal mail steamers of the Zeeland Steamship Company, all of which are about 1,700 tons burden and from 3,000 to 4,000 horsepower, running, if necessary, 17 to 18 knots an hour. This mail route was established in 1877. The length of the lines is 130.4 miles, viz: Flushing to Rosendael, 46.6; Rosendael to Breda, 15.5; Breda to Boxtel, 23.6; Boxtel to Eindhoven, 12.4; Eindhoven to Venlo, 32.3.

The Maas bridge, near Venlo, is 744 feet in length.

The first-class passenger rates from Flushing are: To Rosendael, $1.40; to Breda, $1.80; to Boxtel, $2.30; to Eindhoven, $2.60, and to Venlo, $3.30.

Six fast trains, 10 ordinary passenger trains, and 6 freight trains are operated on these lines daily.

(4) Line from Amsterdam to Utrecht, Boxtel, Eindhoven, Hasselt, and Liege. The Liege-Hasselt-Eindhoven line was built during the years 1864 to 1866, and the Eindhoven-Boxtel-Bois le Duc line in 1866. (For particulars of the Bois le Duc-Amsterdam line, see above.) The

length of the line is 136 miles, viz: Amsterdam to Utrecht, 21.7; Utrecht to Boxtel, 37.9; Boxtel to Eindhoven, 11.8; Eindhoven to Hasselt, 37.3; Hasselt to Liege, 27.3.

The first-class fares for passengers from Amsterdam are: To Utrecht, 72 cents; to Boxtel, $1.80; to Eindhoven, $2; to Hasselt, $2.96, and to Liege, $3.42.

Two express trains, 4 slow trains, and 10 freight trains run daily between Amsterdam and Liege.

Dutch Railway (*Hollandsche Spoorweg*).—The total length of the line of the Hollandsche Spoorweg is 768 miles. The capital is 22,500,000 florins ($9,045,000), in 22,500 shares of 1,000 florins ($402) each, and is all paid up.

Under a new contract with the Dutch Government, dated January 21, 1890, the Hollandsche Spoorweg was reorganized and received new franchises. Under this contract, the corporation distributes the net profits, not exceeding 4 per cent of the capital, to the shareholders. The remainder of the profits is divided equally between the Government and the shareholders, till the proportion of the shareholders amounts to $6\frac{1}{2}$ per cent, including the above-mentioned 4 per cent. The balance must be divided on the basis of four-fifths to the Government and one-fifth to the shareholders.

The following dividends have been declared: 1840 to 1849 (average), 3 per cent; 1850 to 1859 (average), $3\frac{3}{4}$ per cent; 1860 to 1869 (average), 6 per cent; 1870 to 1879 (average), $6\frac{1}{4}$ per cent; 1880 to 1889 (average), $6\frac{4}{5}$ per per cent; in 1890, $4\frac{3}{5}$ per cent; in 1891, 2 per cent; in 1892, $1\frac{1}{2}$ per cent; in 1893, $2\frac{1}{2}$ per cent.

The corporation has recently contracted for new loans to the amount of 53,000,000 florins ($21,306,000); 18,000,000 florins ($7,236,000) at 3 per cent, and 35,000,000 florins ($14,070,000) at $3\frac{1}{2}$ per cent.

The termini of the various railways starting from Amsterdam, are: Helder, Leenwarder, Zwolle, Salsbergen, Winterswyk, Cleve, Venlo (last four on German frontier), Rosendael (Belgian frontier), Haarlem, Hague, Rotterdam, and Hoek of Holland.

At the Hoek of Holland, direct communication with England is afforded by steamers. This route was established June, 1893.

Passenger rates, per kilometer (0.62137 mile), are as follows:

Tickets.	First class.	Second class.	Third class.
	Cents.	*Cents.*	*Cents.*
Single-trip	2	1.6	1
Round-trip	2.4	1.9	1.2

The freight rates, in slow trains, per long ton (2,204.6 pounds) are as follows:

Distances.	In part loads.	Special goods in part loads.	Goods in full loads.		
			Class A.	Class B.	Class C.
Terminal charges	*a* $0.28	*a* $0.28	$0.20	$0.20	$0.20
Freight per kilometer (0.62137 of a mile) for distances—					
From 1 up to 50 kilometers (31 miles)	.016	.014	.012	.01	.008
From 51 to 150 kilometers (93 miles)	.012	.01	.01	.008	.004
From 151 to 250 kilometers (155 miles)	.008	.01	.008	.004	.004
Over 250 kilometers	.004	.04	.004	.004	.004

a Including costs of loading and unloading.

The rates for express goods are double the rates for slow-train goods in part loads or in full loads. Fractions of a cent to be charged as a cent.

The rates on goods in part loads and on special goods are applied to consignments of less than 5,000 kilograms (11,023 pounds); those of Classes A and B on consignments of at least 5,000 kilograms, and those of Class C on consignments of at least 10,000 kilograms (22,046 pounds) per used truck.

The principal bridges of the Hollandsche Spoorweg are: Dordrecht-Geldermalsen, crossing the River Merwede; Amersfoort-Kesteren, crossing the River Rhine, and Apeldoorn-Deventer, crossing the River Yssel.

OCEAN LINES.

The Netherland American Steamship Company, headquarters at Rotterdam, is controlled by the Nederlandsche Amerikaansche Hoomvaart Maatschappy. The steamers of this line sail twice a week from Rotterdam to New York, calling at Boulogne sur Mer, and twice a month from Amsterdam to New York.

The steamers, with tonnage and horsepower, are:

Name.	Registered tonnage.	Horse-power.	Name.	Registered tonnage.	Horse-power.
Amsterdam	3,629	375	Rotterdam	3,329	300
Didam	2,751	450	Spaarndam	4,539	600
Dubbeldam	2,700	450	Schiedam	2,745	300
Edam	3,130	500	Veendam	3,986	600
Maasdam	3,984	600	Werkendam	3,657	400
Obdam	3,245	400	Zaandam	3,063	500
P. Caland	2,584	350			

The first-class passenger rates vary, according to the season, the steamers and the locations thereon, from $55 to $74.

The company reports that so much depends upon the nature of the goods and the countries in which they originate, that it is impossible to give a fixed tariff for freights.

The Royal West Indian Mail Service (*Koninklyke West Indische Maildienst*), headquarters at Amsterdam, is controlled by two corporations, viz, Lloyds Veritas and the Netherland Society of Underwriters.

The steamers of this line sail every three weeks from Amsterdam to New York, via Paramaribo, touching at Demerara, Trinidad, Carupano, Cumana, Guanta, La Guayra, Porto Cabello, Curacao, Jacmel, Aux Cayes, and Port au Prince.

Returning from New York the steamers touch at all these points, and also call at Havre, en route to Amsterdam.

The steamers, with tonnage and horsepower, are:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Oranje Nassau	1,304	750	Prins Willem II	1,950	1,250
Prins Maurits	1,310	750	Prins Willem III	1,950	1,250
Prins Frederik Hendrik	1,642	1,200	Prins Willem IV	1,950	1,250
Prins Willem I	1,950	1,250			

The steamers carry first-class passengers to the West Indian ports only. The rates are from $160 to $182.

This company reports that it is impossible to give a fixed tariff for freights.

The Netherlands Steam Navigation Company (*Stoomvaart Maatschappy Nederland*) is a joint stock company established at Amsterdam in 1870, with a funded capital exceeding 5,000,000 guilders ($2,000,000). The termini are Amsterdam, Batavia, Samarang, and Soerabaya. The main points touched are Southampton, Genoa, Port Said, Suez, and Padang. Length of total line: Amsterdam to Batavia, 2,269 geographical miles; Batavia to Samarang, 58; Samarang to Soerabaya, 95; mail route, Genoa to Batavia, 1,706.

There is a fortnightly mail service and a cargo line between Holland, Padang, and Java, occasionally calling at Hamburg.

The steamers, with tonnage and horsepower, are:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Burgemeester dam Tex	3,000	500	Prinses Amalia	3,500	550
Conrad	3,100	400	Prinses Marie	2,800	400
Koningin Regentes	3,700	550	Prinses Wilhelmina	2,600	400
Prins Alexander	3,000	500	Prinses Sophie	3,500	550
Prins Hendrik	3,500	550	Sumatra	2,600	400

First-class passenger rates are: From Amsterdam to Genoa, $60; Port Said, $100; Batavia and Padang, $320. Batavia and Padang to Amsterdam, $300; Genoa, $252; Port Said, $212.

EDWARD DOWNES,
Consul.

AMSTERDAM, *May 10, 1895.*

DENMARK.

OCEAN LINES.

Thingvalla Steamship Company.—The most important ocean line, in connection with the foreign trade and commerce of Denmark, and the line best known to travelers between the United States and Scandinavia, is the Thingvalla Steamship Company, Limited. It was established in 1879 to meet the demands of the increasing trade and passenger traffic between the three Scandinavian countries and the United States. Before the establishment of this line, merchandise to and from these countries was sent indirectly, and of course with increased risk and expense. Passengers also were compelled to travel either via Great Britain or continental ports, at an additional outlay of time and money. This business is now done largely by the Thingvalla Line, which is operated and controlled by a board of directors with headquarters in Copenhagen, and is free from Government interference.

The company's fleet consists at the present time of five steamships, as follows:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Amerika	4,058	3,000	Island	2,844	2,300
Hekla	3,258	2,200	Thingvalla	2,525	1,000
Norge	3,358	1,400			

These steamers ply between Copenhagen and New York, calling at Christiania and Christiansand, in Norway. As a rule, the steamers when in Copenhagen make a trip to Stettin to discharge and load cargo from and to the United States. Passengers, however, are not booked for passage from Stettin.

From Copenhagen to New York, the distance over this route, going via the north of Scotland, is nearly 3,810 miles. From Copenhagen to Christiania it is 275 miles, and to Christiansand, 440 miles. The steamers of the line run a fortnightly service between these ports, leaving New York every alternate Saturday from the pier at the foot of Fourth street, Hoboken and every alternate Tuesday from Copenhagen, leaving Christiania on Thursday and Christiansand on Friday. During the busy season an extra passenger steamer is put on to accommodate the large number of tourists and travelers visiting Scandinavia and the North Cape of Norway. This "land of the midnight sun" is rapidly becoming a favorite resort of American sightseers, and the Thingvalla Line offers the most direct route to tourists and travelers visiting Norway. The rates for first-class passage are quite reasonable, varying in the summer from $60 to $75, according to location and number of berths in stateroom. In winter, the rates on some of the steamers are $10 less. On account of these inducements, the Thingvalla Line does its

fair share of passenger traffic and is steadily gaining favor with Americans.

Freight rates vary according to the New York markets and the different classes of goods shipped. The mean freight rate during 1893 was $4.82 per ton going east and $3.21 per ton going west.

During the year ending December 31, 1893, the company transported 2,565 cabin passengers, 17,269 third-class or steerage passengers, and 78,108 tons of freight.

United Steamship Company.—This company (Det Forenede Dampskib Selskab), the largest and most powerful concern in the Danish merchant marine, with a fleet at present consisting of 112 vessels, varying in size from coasters of 100 tons burden to ocean steamships of 2,100 tons, maintains a regular packet service between Copenhagen, the home port and headquarters of the company, and all the principal European ports, including important points on the Mediterranean, the Adriatic, the Archipelago, and the Black Sea. This line is not under Government control, but receives a subsidy for making regular sailings and carrying the mails between Copenhagen and the Faroe Islands and Iceland, and carrying provisions between Esbjarg, in Jylland, and Parkeston, in England.

A steamer leaves Copenhagen for the Faroe Islands and Iceland every fourteen days. The three steamers plying on this route are:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Laura	1,068	150	Nidaros	859	160
Thyra	830	90			

The run from Copenhagen to Reykjavik, the terminus of the line, is made in the schedule time of twelve days. The price of a first class ticket to the Faroe Islands is 70 kroner ($18.76), and to Iceland 90 kroner ($24.12). These rates are exclusive of living aboard, which, in the first-class cabin, is 4 kroner ($1.07) per adult per day.

From Copenhagen to Christiania direct, and vice versa, there are two trips weekly by the *C. P. A. Koch*, of 1,149 tons and 173 horsepower, and the *M. G. Melchior*, of 1,153 tons and 200 horsepower. A first-class ticket costs 28 kroner ($7.50), exclusive of living aboard.

Besides these direct boats, there are smaller vessels running between Copenhagen and Christiania and calling at intermediate points on the Christiania Fjord.

Between Copenhagen and all points on the coast of Norway between Frondheim and Christiansand, there is a steamer once a week both ways. The following steamers are at present running on this route:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Axelhuus	659	90	Tula	700	100
Christiandsund	580	85			

The price of a first-class ticket to Frondheim is 55 kroner ($14.74); to Christiansand, 24 kroner ($6.43).

This company also runs a regular packet line from Copenhagen to the following Baltic ports, except when prevented in the winter season on account of ice:

To—	Trips.	Fare.	
		Danish money.	Equivalent in United States money.
		Kroner.	
St. Petersburg	Weekly	45.00	$12.06
Hango	do	36.00	9.65
Riga	Fortnightly	36.00	9.65
Libau	Semiweekly	27.00	7.24
Konigsberg	Weekly	21.35	5.72
Dantzig	do	21.35	5.72
Stettin	do	16.00	4.29
Hamburg	Semiweekly	16.00	4.29

There is also a regular service between Copenhagen and England, as follows: To London, weekly, fare 45 kroner ($12.06); to London, via Esbjarg and Parkeston, triweekly, fare 56 kroner ($13.33); to Hull, weekly, fare 45 kroner ($12.06).

The following steamers run on the routes:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Copenhagen and London:			Copenhagen and Hull:		
Christian IX	1,236	120	Frederick	1,114	120
Perna	1,132	150	Louise	1,115	120
Kasan	1,132	150			
Vendsyssel	793	100			

In addition to the foregoing lines, the United Steamship Company maintains a regular service between the Baltic Sea (Copenhagen always being the port of departure) and Spain, Portugal, Marseilles, Italy, and Sicily. About every twenty days there is a departure for Marseilles and Italy, and every ten days a departure for Spain. The ports of call on this route are: Oporto, Lisbon, Malaga, Carthagena, Valencia, Tarragona, Barcelona, Marseilles, Genoa, Leghorn, and Naples.

The steamers plying on the line are:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Vesuv	949	100	J. C. Jacobsen	1,227	130
Dagmar	1,175	120	Chr. Broberg	1,227	130
Baron Stjernblad	999	130	Kiew	1,122	150
O. B. Suhr	1,506	150			

The company's steamers will also call at any other ports in Spain, France, Portugal, or Italy should sufficient inducement in the way of freight be offered, and also at ports on the African coast when there may be cargo in the market for the north. Goods are taken to Huelva and Seville on through bills of lading, with transshipment at Cadiz.

Between Copenhagen and Bordeaux, three or four steamers are kept constantly running, so as to make a trip in both directions about fortnightly. In April and September fast boats are dispatched from Copenhagen to Madeira, taking passengers and goods to and from all northern ports. These boats running to the Mediterranean are adapted more especially to the freight trade, but a limited number of passengers can be accommodated with berths and private cabins at the following rates from Copenhagen, exclusive of living expenses aboard: To Havre, Rouen, and Dunkirk, 54 kroner ($14.47); to Bordeaux, 72 kroner ($19.30); to Portugal, 108 kroner ($28.94); to Spain and Italy, 126 kroner ($33.77).

Vessels also run to the Levant and Black Sea every fourteen days. The points of call on this route are: Antwerp, Algiers, Tunis, Piraeus, Smyrna, Salonica, Constantinople, Sebastopol, and Odessa. The company's fleet at present engaged in this trade is as follows:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Antwerp	1,713	130	A. N. Hansen	1,506	150
Georgios I	1,617	150	Tomsk	1,590	180
Leopold II	1,618	150	L. P. Holmblad	2,141	173
Omsk	1,591	180	Castor	1,259	110
Alexander III	1,842	190			

By special agreement with the Belgian Government, freight not above 2,000 kilograms (4,409 pounds) may, since the 1st of January, 1894, be forwarded on through bills of lading from all railway stations in Belgium to the various ports on this company's route.

Goods are taken at through rates, with transshipment at Copenhagen to and from all ports mentioned in the above list and all ports in Germany, Denmark, Norway, Sweden, Russia, and Finland. Goods are also taken at through rates, with transshipment at Tunis, Piraeus, Smyrna, and Odessa to points in the north of Africa, Greece, Asia Minor, and the Black Sea. A limited number of passengers can be accommodated on all the ships in the Black Sea trade. A cabin ticket to any of the ports mentioned above, exclusive of living aboard, can be had for 180 kroner ($48.24).

As to the rates charged for freight by the United Steamship Company I regret that my efforts in this direction have not been successful. I can only quote the answer of Mr. Norman, the general manager, in reply to my letter of inquiry. He writes: "As to freights on our lines between the different ports, I regret that I am not able to give you any information, the rates fluctuating according to the conditions, which may be favorable at one time and unfavorable at another."

Scandia line.—This line is largely engaged in the freight trade between Copenhagen and New York, but is not allowed to take passengers at Danish ports. Passengers from Denmark can, however, ship by the Scandia Line by crossing the sound to Helsingborg, Sweden.

Copenhagen is only a port of call on this line, the home port being Stettin, and the line itself being a part of the Hamburg-American Line.

The following steamships comprise the present fleet of the company:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Virginia	2,884	350	Slavonia	2,274	250
Polynesia	2,196	270	Venetia	2,891	350

The rates for freight on this line are the same as on the Thingvalla Line, viz, $4.82 per ton going east and $3.21 per ton going west. Of course, only the mean or average rate is intended by these figures, as the rates will vary according to the state of the market and the character of the goods.

RAILWAYS.

All the lines which carry through mails, freight, etc., belong to the State except a line of 45 kilometers (27.96 miles) from Orehoved to Gjedser, Island of Falster, which belongs to a private corporation, but is under Government control.

There are three main lines running out of Copenhagen, the great railway center of Denmark—the north, south, and west lines. Mails, passengers, and freight to and from the Continent and England go by the south and west lines, and to Sweden and Norway by the north line.

South line.—This line, extending from Copenhagen to Kioge, 55 kilometers; to Nastved, 92 kilometers; to Gjedser, the terminus, 157 kilometers—97.56 miles, is the most direct line to east, middle, and south Germany, via Warnemunde and Rostock (Mecklenburg), reaching Berlin by express train in eleven and one-half hours. Between Copenhagen and Gjedser, passengers, freight, etc , are carried over the distance between Masnedsund, Island of Sjalland, and Orehoved, Island of Falster, by steam ferry in ten to fifteen minutes; and from Gjedser, Falster, to Warnemunde, Germany, in two hours, twice daily. From Warnemunde there are trains to all parts of Germany.

West line.—This line, extending from Copenhagen to Roskilde, 32 kilometers; Ringsted, 64 kilometers; Korsor, the terminus, 112 kilometers—69.60 miles, is the most direct line to west Germany, France, and England, via Hamburg. The running time from Copenhagen to Hamburg is twelve and one-half to thirteen and one-half hours by two different routes: (1) Via Kiel by comfortable mail steamers from Korsor, about seven hours, twice daily, and by train from Kiel to Hamburg; (2) via Nyborg, Island of Fyen, and Fredericia, Jutland, by large steam ferryboats, carrying from six to ten railway carriages, with passengers' baggage, and freight, from Korsor to Nyborg in one and one half hours; thence by railway to Strib; thence by steam ferry, carrying four to six railway carriages, to Fredericia in ten minutes; thence by train to Hamburg—twice daily.

Part of the traffic to and from England is also carried from Copenhagen, via Nyborg and Fredericia, to Esbjerg (west coast of Jutland), in eight and one-half hours from Copenhagen, and from Esbjerg to Harwich (near London) by steamers, three or four times weekly, in twenty-eight or thirty hours from Esbjerg to London.

North line.—This line, from Copenhagen to Elsinore (45 kilometers—27.96 miles), is the most direct line from Copenhagen to Norway and West Sweden. From Elsinore, passengers, freight, and railway cars are carried by steam ferryboats (same size as between Korsor and Nyborg) in fifteen minutes to Helsingborg, Sweden; thence by train to Gothenberg (eight and one-half hours from Copenhagen), and thence to Christiania (twenty hours from Copenhagen), twice daily. Fredericksborg and Fredensborg are the most important points on this line.

In Jutland, there are also trains from Fredericia, in connection with trains from Hamburg, to Gothenberg by steamer from Frederikshavn (North Jutland) daily, and to Christiansand, Norway, twice a week.

All these lines being under strict Government control and inspection are considered to be in excellent condition. They all have a single track and run two express or mail trains daily and from three to six slow or accommodation trains, as the demands of business may require.

The rates for first-class passenger travel are about $5\frac{1}{2}$ ore ($1\frac{1}{3}$ cents) per kilometer (0.6214 mile). It should be mentioned, however, that the great majority of the people travel second class. The difference in the appointments and conveniences of the two classes of coaches can scarcely be observed, it being practically a distinction without a difference.

Freights are divided into four classes, according to the quantity and character of goods.

Through traffic.—The rates on freight coming into and passing through Denmark in whole car loads, say of 5,000 kilograms (11,023 pounds), from Wamdrup, on the German border, are, per ton of 1,000 kilograms (2,204 pounds), according to the class of goods (first, second, third and fourth): To Copenhagen, 283 kilometers (175.86 miles), $1.42, $1.61, $2.04, and $2.71. To Elsinore, 328 kilometers (203.8 miles), $1.55, $1.77, $2.22, and $2.87. To Helsingborg, Sweden, by ferry from Elsinore, 388 kilometers (241 miles), $1.58, $1.80, $2.26, and $2.92.

There is neither river nor canal navigation in Denmark.

HIGHWAYS.

The country being level, with no great obstacles to overcome in the construction of roads, the Kingdom of Denmark has probably the best public highways in Europe. Wherever the railroad runs, there runs the corresponding "King's highway," 40 feet wide, with ditches on each side 4 to 5 feet deep, and, in most cases, with shade trees on each side. The roads are built of stone and gravel, packed and rolled smooth; and there being no great distances to contend with, they are always in

splendid condition. In the Island of Sjalland, the principal highways run from Copenhagen to Elsinore, from Copenhagen to Korsor, and from Copenhagen to Masnesund. To Elsinore, there are two highways, the Kongevej or "King's highway," which runs parallel with the railroad, and the Strandvej, running along the sound. In the Island of Fyen, the principal highway runs from Nyborg, via Odense, to Middlefart.

In Jutland, the highway runs from Fredericia to Frederikshavn, in the north, via Aarhus and Aalborg; from Randers, it runs westward to Lemvig, and thence southward along the west coast to Ribe.

ROBT. J. KIRK,
Consul.

COPENHAGEN, *September 25, 1894.*

FRANCE.

TRANSPORTATION FACILITIES

France is in direct communication, from her leading ports—Marseilles, Havre, Bordeaux, etc.—with all the important seaports of the world. She has, also, the advantage of the facilities and competition afforded by the many lines of maritime transportation connecting the chief British ports—London, Liverpool, Southampton, etc.—with every seaport on the globe, it being but a few hours by water, or water and rail, from Havre, Calais, or Boulogne to the most distant of these cities. An extensive coastwise service is also in operation, and there is regular and frequent communication by water between the numerous French ports on the British Channel, the Atlantic Ocean, and the Mediterranean Sea.

The various facilities for interior transportation are of the best, consisting not only of a network of railways, but also of the great rivers, an extensive canal system, and a system of public highways unsurpassed, if not unequaled, in any other country, and which extends to every part of the Republic. Altogether, the facilities enjoyed by the people of France, within the country, as well as for external traffic, are certainly not inferior to those of any other country in Europe, with the possible exception of the United Kingdom. The ocean and coastwise service is constantly being enlarged; the railway system is being developed, not only by extensions, but also by betterments of lines and service, while the admirable system of canals, which has proved such an important factor in the commercial and industrial development of the country is not only being maintained, but extended, and large expenditures are being made annually in the interest of river navigation.

OCEAN AND CHANNEL LINES.

Only the great lines of communication connecting French ports directly with the ports of other countries will be considered under this head, although several British lines, which do not touch at French ports, notably the great transatlantic lines from Southampton and Liverpool and the Peninsular and Oriental Navigation Company, transport vast quantities of merchandise and great numbers of passengers originating in or destined to France.

The principal ports of France, in the order of their importance, are Marseilles, Havre, Bordeaux, Dunkirk, Boulogne, Rouen, Calais, Dieppe, St. Nazaire, Cette, Bayonne, Nantes, and Nice. The three ports first named—Marseilles, Havre, and Bordeaux—are the chief centers of ocean commerce, the tonnage of the others mentioned being mostly devoted to channel, coastwise, and interior navigation.

1. Marseilles.

Ocean Lines.—By far the most important French port is Marseilles, which is the gateway through which passes most of the vast ocean commerce between this country and the rest of the Eastern Hemisphere.

The movement of exterior navigation, as officially reported for all the French ports during 1894, represented an aggregate tonnage of 22,565,830, of which 6,592,841, or about 29 per cent of the whole, was registered from Marseilles. The appended statement, prepared by Mr. Claude M. Thomas, the consul of the United States at Marseilles, presents a complete exhibit of the operations of the many lines of maritime transportation which connect Marseilles directly with nearly all the seaports of the world.

The following companies sailing their vessels under the French flag operate from the port of Marseilles:

Messageries Maritimes.—The fleet of this company consists of forty-five ships, with tonnage and horsepower as follows:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Ernest Simons	5,500	6,000	Peïho	3,392	2,400
Océanien	4,259	3,400	Amazone	3,350	2,400
Yarra	4,255	3,400	Ava	3,361	2,400
Salazie	4,255	3,400	Iraouaddy	3,785	2,900
Sydney	4,232	3,400	Mpanjaka	684	450
Calédonien	4,232	3,400	Yang-tsé	3,791	2,900
Melbourne	4,080	3,400	Djemnah	3,785	2,900
Natal	4,017	3,400	Niger	3,726	2,900
Saghalien	4,050	2,900	Gironde	3,260	2,900
Oxus	3,790	2,900	Senégal	3,716	2,900
La Seyne	2,353	2,000	Ortégal	3,656	1,900
Godavéry	1,480	1,600	Tigre	3,234	1,400
Eridan	1,852	1,400	Cambodge	2,599	1,400
Tibre	1,838	1,600	Sindh	3,373	2,000
Aréthuse	1,246	1,400	Médoc	3,655	1,900
Haïphong	1,548	1,400	Nerthe	3,718	2,900
Tamise	2,333	1,400	La Bourdonnaise	2,045	1,600
Manche	2,315	1,400	Alphée	1,960	1,400
Armand-Behic	6,548	7,000	Erymanthe	2,095	1,400
Polynésien	6,562	7,000	Guadalquiver	2,638	1,400
Australien	6,563	7,000	Guadiana	2,632	1,400
Ville de la Ciotat	6,542	7,000	Douro	2,745	1,400
Tanaïs	1,824	1,600			

In addition to these, the company has in process of construction two boats of very large capacity. It has at present, with its forty-five boats, a gross tonnage of 152,774, and a horsepower of 123,150.

The lines of the company from Marseilles are:

(1) For Yokohama, leaving Marseilles each alternate Sunday, and touching at Alexandria, Port Said, Suez, Aden, Colombo, Singapore, Saigon, Hongkong, Shanghai, and Kobe. A transfer is made at Colombo for Pondicherry, Madras, and Calcutta; at Singapore, for Batavia and Samarang, and at Saigon, for Tonquin ports.

(2) For Australia and New Caledonia, leaving Marseilles once monthly, always on the 1st or 3d, and touching at Port Said, Suez, Aden, Seychelles, King Georges Sound, Adelaide, Melbourne, Sydney, and Noumea. A transfer is made at Seychelles for Reunion and Mauritius.

(3) For the east coast of Africa, leaving monthly, always on the 12th, and touching at Port Said, Suez, Obock, Aden, Zanzibar, Mayotte, Nossi Be, Diego Suarez, Sainte Marie, Tamatave, Reunion, and Mauritius. A transfer is made at Aden for Bombay and Kurrachee; also at Nossi Be, for the west coast of Madagascar, touching at Majunga, Mainterano, and Morundava.

(4) For Syria, each alternate Saturday, touching first at Alexandria. Port Said, Jaffa, Beyrout, Tripoli, Lattaquie, Alexandretta, Mersina, Smyrna, Salonica, and Piraeus.

(5) For Syria, each alternate Saturday, touching first at Piraeus, Salonica, Smyrna, Larnica, Mersina, Alexandretta, Lattaquie, Tripoli, Beyrout, Jaffa, Port Said, and Alexandria.

(6) For Constantinople and the Black Sea, leaving Marseilles each alternate Saturday, and going by way of Piraeus, Smyrna, Dardanelles, Constantinople, Samsoun, Kerassunde, Trebizonde, and Batoum; returning via Trebizonde, Kerassunde, Samsoun, Constantinople, Dardanelles, Syra, and Calamata.

(7) For Odessa, each alternate Saturday, touching at Calamata, Syra, Dardanelles, Constantinople, Odessa, and returning by way of Constantinople, Dardanelles, Smyrna, and Piraeus.

(8) For London, via Havre, every Friday.

Compagnie Nationale de Navigation.—This company has eight boats, with one in process of construction, their names, tonnage, and horsepower being:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Canton	3,720	2,000	Chéribon	3,074	2,000
Colombo	3,733	2,000	Cachar	3,645	2,000
Comerin	3,747	2,000	Cachemire	3,359	2,000
Chandernago	3,074	2,000	Hindoustan	2,592	1,900

The company owns a tonnage of 26,944, and horsepower aggregating 15,900. Its lines from Marseilles are:

(1) For Haiphong (Tonquin), leaving and returning once monthly, and touching at Obock, Djiboute, Singapore, Saigon, and Touram (Annam).

(2) For New York, by way of Naples. This line is not at present in operation. The line is conducted in the interest of the Italian emigrant trade, and the ships are run only when there are demands of this nature.

Fraissinet et Cie.—This company has a fleet of twenty-four boats, with tonnage and horsepower as follows:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Tibet	3,500	800	Euxène	1,200	250
Liban	3,000	800	Junon	1,200	250
Amérique	3,000	700	Cyrnos	800	400
Stamboul	3,000	600	Ville de Bastia	800	400
Tabor	2,700	500	Bocognano	800	400
Taurus	2,500	400	Marie-Louise	700	120
Taygète	2,500	400	Saint-Marc	700	120
Pélion	2,500	400	Persévérant	500	200
Balkan	2,500	400	Blidah	400	120
Galatz	2,500	400	Durance	400	120
Braïla	2,500	400	Médéah	300	120
Gyptis	1,200	250	Ande	200	100

The tonnage of the company is 39,400, with a horsepower of 8,700. Its lines from Marseilles are:

(1) Line for the Levant and the Danube. This line is called by the company Ligne A. The boats leave Marseilles each alternate Thursday, touching at Genoa, Syra, Smyrna, Dedeah, Rodasto, Constantinople, Soolina, Galatz-Braila, returning by way of Soolina, Constantinople, and Smyrna.

(2) Line for the Levant and the Danube, and called by the company Ligne B. The boats leave each alternate Thursday, between the sailings of Ligne A, and touch at Genoa, Piræus, Salonica, Dardanelles, Gallipoli, Constantinople, Soolina, Galatz-Braila. The boats return by way of Soulina, Constantinople, Dedeah, Salonica, and Piræus.

The winter service of these lines does not go beyond Constantinople, embracing the dates between November 15 and March 1.

(3) Line for Cette and Agde, leaving Marseilles every day at 7 p. m., returning direct.

(4) Line for Genoa, by way of Cannes and Nice, returning from Genoa direct to Marseilles every Wednesday.

(5) Line direct to Genoa, every Sunday and Thursday.

(6) Line for Nice, by way of Cannes, every Monday. Return direct to Marseilles.

(7) Line for La Nouvelle, direct, every Tuesday and Saturday.

(8) Line for Calvi and Ile Russe, direct, every Tuesday.

(9) Line for Leghorn, by way of Bastia (Corsica), every Sunday and Thursday.

(10) Line for Naples and return, direct, every Wednesday.

(11) Line for Bonifacio (Corsica), going by way of Toulon and Nice, each alternate Friday.

(12) Line for Corsican points (touching at Ajaccio, Propriano, then to Porto Tarres (Sardinia), and return, every Friday.

(13) Line for the west coast of Africa (the company's Ligne A). The boats leave Marseilles the 25th of February, and subsequently the 25th of each alternate month, touching at Oran, Las Palmas, Dakar, Conakry, Grand Bassam, Cotonow, and Loango; returning to Marseilles by way of Dakar and Las Palmas.

(14) The company's Line B, for the west coast of Africa: These are slower boats than on Line A, and carry no mails. The boats leave Marseilles each alternate month, not occupied by Line A, and touch at Las Palmas, Dakar, Conakry, Grand Bassam, Cotonow, and Libreville.

Compagnie Cyprien Fabre.—This company has fifteen boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Gallia	1,300	500	Britannia	3,200	1,100
Lutetia	1,500	500	Albia	3,000	1,200
Foria	1,500	500	Alesia	3,700	1,300
Syria	1,500	600	Burgundia	3,700	1,300
Druentia	1,500	600	Neustria	3,300	1,500
Diolibah	2,200	850	Pictavia	3,000	850
Gergovia	2,500	900	Massillia	4,000	1,600
Maurice et Réunion	2,700	850			

The company thus owns a tonnage of 38,600, and 14,150 horsepower. Its lines from Marseilles are:

(1) For Oran, departing and returning once weekly.

(2) For Syria, touching at Alexandria, Jaffa, Acre, Beyrout, Alexandretta, and Mersina. On this line the boats depart every three weeks from March to August, and every two weeks from September to February.

(3) Line for La Plata and Rosario direct, departing once monthly.

(4) Line for New York, touching at Naples. Boats depart every two to three weeks, and are devoted to the transportation of merchandise from this port to New York, and vice versa, calling on the way out for emgirants at Naples.

Société Générale de Transports Maritimes à Vapeur.—This company owns a fleet of seventeen boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Anjou	610	400	Aquitaine	2,736	2,400
Artois	845	800	Béarn	3,334	2,000
Auvergne	1,395	1,200	Bourgogne	1,698	1,200
Berry	1,491	1,400	Bretagne	1,614	1,200
Dauphiné	853	800	Espagne	3,448	2,800
Franche-Comté	845	800	La France	3,106	1,500
Languedoc	1,491	1,400	Italie	3,500	2,800
Lorraine	845	800	Provence	3,434	2,400
Touraine	946	800			

The company's total tonnage is 32,191, and horsepower 24,700. Its lines from Marseilles are:

(1) For Buenos Ayres, departing from Marseilles, twice monthly, touching at Barcelona, Gibraltar, Teneriffe, Dakar (sometimes at the Canaries and Senegal), Bahia, Rio Janeiro, Santos, Montevideo, and Buenos Ayres.

(2) For Algeria and Tunis, departing from Marseilles five times per week, and touching at Algiers, Arzew, Bone, Bougie, Djidjelli, Mastaganem, Oran, Philippeville, and Tunis.

(3) For Genoa, departing many times monthly, at irregular dates, depending upon the demands of traffic.

(4) A weekly service, departing from Cette for Algiers and Tunis.

Compagnie de Navigation Marocaine et Arménienne.—The company has eight boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Anatolie	2,332	1,500	Meurthe	1,129	500
Arménie	2,119	1.400	Meuse	1,312	700
Circassie	2,454	1,700	Mingrélie	2,337	1,500
La Gaule	1,597	800	Moselle	335	440

The total tonnage of the company is 14,613, and horsepower 8,540. Its lines from Marseilles are:

(1) Line for the Black Sea, departing from Marseilles twice monthly, on alternate Wednesdays, touching at Dardanelles, Constantinople, Samsoun, Kerassunde, Trebizonde, Batoum, and Novorossisk; returning by same points.

(2) Line for Morocco and the Canaries, departing from Marseilles the 7th and 23d of each month. The boats touch at Gibraltar, Tangier, Casablanca, Mazagan, Mogador, Teneriffe, Las Palmas, and return the same route.

Campagnie Française de l'Afrique Occidentale.—The company has two boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Foulah	1,500	560	Mandingue	1,400	580

The total tonnage is 2,900 and horsepower 1,140. The boats depart, and return, once each month for the west coast of Africa, touching at all points between St. Louis du Senegal and the English colony of Sierra Leone.

Compagnie Générale Transatlantique.—In the Mediterranean service this company has a fleet of twenty-six boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Général Chanzy	2,330	3,800	Ville de Barcelone	1,905	2,000
Ville d' Alger	2,235	3,500	Ville d'Oran	1,936	2,000
Maréchal Bugeaud	2,235	3,500	Ville de Bone	1,938	2,000
Duc de Bragance	2,102	3,300	Ville de Naples	1,879	2,000
Eugéne Pereire	2,078	3,300	Ville de Rome	1,870	2,000
Ville de St. Nazaire	2,666	2,600	Kléber	1,900	2,000
Ville de Brest	2,676	2,600	Afrique	1,227	1,100
Ville de Tunis	1,966	2,000	Ajaccio	1,228	1,100
Moïse	1,873	2,600	Bastia	1,227	1,100
St. Augustin	1,854	2,600	La Corse	1,226	1,100
Isaac Pereire	1,855	2,000	La Cettori	1,233	1,100
Abd-el-Kader	1,859	2,000	Alice	972	400
Ville de Madrid	1,874	2,000	Venezuela	955	700

The company's tonnage from Marseilles is 47,099, with a horsepower of 54,400. Its lines from Marseilles are:

(1) Marseilles to Colon, once monthly, and touching at Barcelona, Malaga, Teneriffe, Trinidad, Carupano, La Guayra, Puerto Cabello, Curacao, Cartagena, Colon; returning by way of same ports.

(2) For Algiers, direct, departing from Marseilles every Monday, Wednesday, Thursday, and Saturday. On Wednesday, this line takes passengers for Dellys and Djidjelli.

(3) For Philippeville, by way of Ajaccio (Corsica), Bone, and Bougie.

(4) Line for Tunis, departing from Marseilles every Monday, Wednesday, and Friday, touching first at Tunis, Bizerte, Tabarka, La Calle, Bone, Philippeville, Callo, Djidjelli, Bougie, Dellys, Algiers, Port Neuches, Cette, St. Louis, Marseilles. A similar line runs thrice weekly, making these points in inverse order.

(5) For Bone, direct, every Saturday.

(6) For Oran, direct, every Saturday.

(7) For Philippeville, direct, every Wednesday and Friday.

(8) For Tripoli every Friday, touching at Tunis, Watta, Tripoli, Djerba, Gabes, Sfax, Mehdia, Monastir, and Sousse.

(9) For Gibraltar, every Tuesday, returning by way of Tangiers, Malaga, Melilla, Nemours, and Oran.

(10) For St. Nazaire, by way of Algiers, Oran, and Bordeaux, every Sunday.

Compagnie de Navigation Mixte.—The company has a fleet of eleven boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Félix Touache	1,400	300	Emir	1,325	250
Rhône	1,400	300	Tell	1,270	225
Kabile	1,400	300	Soudan	883	150
Tafna	1,400	300	Alger	798	180
Oasis	1,392	250	Oran	790	120
Isly	1,392	250			

The company's tonnage is 12,450; its horsepower 2,625. It conducts the following lines, starting from Marseilles:

(1) For Algiers, direct, three sailings per week.
(2) For Djidjelli, by way of Algiers and Bougie.
(3) For Tunis, once per week.
(4) For Philippeville, once per week.
(5) For Bone, twice per week.
(6) For Oran, once per week, direct.
(7) For Mastaganem, by way of Cette, Oran, and Arzew, once weekly.
(8) Marseilles to Cette, daily.
(9) For the west coast of Africa, one sailing each six weeks, touching at Las Palmas, Dakar, Conakry, Sierra Leone, Grand Sahon, Half Jack, Grand Bassam, Grand Popo, Whydah, and Cotonow.

Compagnie Costaldi.—The company has five boats, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Pytheas	400	230	Louis C	230	200
Michel C	300	248	Perigame	150	150
Marie	250	275			

The company has a tonnage of 1,330; horsepower, 1,103. Its lines from Marseilles are:

(1) Twice weekly for Cette, by way of Agde.
(2) Once weekly for La Nouvelle, by way of Cette and Port Vendres; once weekly for the same ports in the reverse order.
(3) Once weekly for Mentone, by way of Cannes and Nice.
(4) Once weekly for St. Trapes, by way of Cannes and Nice.
(5) Once weekly for Nice, by way of Antibes.

Compagnie des Bateaux à Vapeur du Nord.—This company has in service from Marseilles nine boats, viz:

Name.	Tonnage.	Name.	Tonnage.
Ville d'Arras	832	Nantes-Bordeaux	880
President Leroy-Lallier	750	Ville de Marseille	756
Frédéric Movel	822	Cambrai	611
N. Verberckmoes	779	Ville de Lille	590
Ville de Dunkerque	783		

The company's tonnage is 6,803. It is not possible to secure the horsepower at the Marseilles office. Its lines from Marseilles are:

(1) For Bordeaux and Dunkirk, departing five times monthly.
(2) For La Rochelle, once monthly.

This company's boats do not take passengers from Marseilles.

Société Navale de l'Ouest.—This company has in the Mediterranean service seven boats, viz:

Name.	Tonnage.	Name.	Tonnage.
St. André	557	St. Mathieu	553
St. Jean	561	St. Paul	585
St. Luc	474	St. Pierre	571
St. Marc	553		

The tonnage is 3,854. The horsepower could not be secured at the Marseilles office.

The company conducts a weekly service from Marseilles to Antwerp, going by way of Lisbon, Nantes, Rouen, and Havre.

The foregoing twelve companies embrace all the French companies operating from the port of Marseilles, whose boats sail according to a prescribed schedule, or who actually own boats, the names and tonnage of which can be secured. Other companies, such as the Compagnie Toulon, Compagnie Avenir, and the Compagnie Lyonnaise de Navigation sur le Rhône, possess what are called transports, and small boats such as are known in America as tugs; but the names of these and the tonnage, which is of course immaterial, can not be secured. It will be observed that the above twelve companies possess 177 vessels, with a combined tonnage of 378,958 and a horsepower of 254,408. The aggregate of horsepower does not include that of the sixteen boats of the two last-named companies. If obtainable, this would probably add a horsepower of about 6,000 to the above figures, bringing the combined horsepower to 260,000, approximately.

FOREIGN OCEAN LINES.—In addition to these, many foreign companies touch regularly at Marseilles, chief of which are:

(1) *The Anchor Line*, touching at Marseilles twice monthly, proceeding from India for Liverpool and Glasgow.

(2) *The Johnston Line*, with a regular service from Marseilles to Constantinople and the Black Sea.

(3) *The Bibby Line*, from English ports for Colombo and Rangoon, and vice versa.

(4) *The United Steamship Company*, monthly, for Copenhagen and the Baltic.

(5) *The Hall Line*, twice monthly from India for Liverpool.

(6) *The Peninsular and Oriental*, weekly from London for all points in the far East; weekly return from the East for London.

(7) *The Robert M. Sloman, jr., Company*, regular service from Marseilles to Hamburg.

(8) *Svenska Lloyd Company*, regular service, Marseilles, Copenhagen and Stockholm.

(9) *Ybarra & Co.*, regular and very frequent service, Marseilles to Bilbao and all Spanish ports.

(10) *Compagnie Transatlantique de Barcelone* (*Lopez et Cie.*), regular service Marseilles and all Spanish ports and Buenos Ayres.

(11) *The Rotterdam Lloyd Company*, departure and return every two weeks between Marseilles and the Netherlands.

(12) *The Adria Line*, twice weekly between Marseilles, Fiume, and Trieste.

(13) *La Compagnie Sévillane*, once weekly Marseilles to Seville and all intermediate Spanish ports.

(14) *The Persian Gulf Steamship Company*, regular service from London to Bagdad, touching at Marseilles each way.

(15) *Compagnie Italienne de Navigation*, regular service Marseilles to Trieste, and vice versa.

(16) *Compagnie Russe de Navigation*, irregular service Marseilles and Black Sea and Danube ports.

(17) *Compagnie Fluviale*, Marseilles and Spanish ports.

(18) *Compagnie Panhellénique*, regular service Marseilles to Greece and Asia Minor.

(19) *Compagnie Valencia*, Marseilles to Valencia and Spanish ports.

(20) *Navigazione Generale Italiana*, every week, Marseilles to Italian and eastern Mediterranean ports; once monthly for Bombay.

In the matter of so-called "tramp" steamers and sailing vessels, anything in the nature of accurate data would occupy a great deal of space, and the facts secured would be of small value. These ships arrive every day at the port of Marseilles, coming and going in any direction demanded by trade.

NAVIGATION AT MARSEILLES.—The following table has been prepared for the year 1893, indicating the number of vessels (both entries and departures), steamers and sailing craft, to and from the port of Marseilles, with the tonnage of the vessels and the actual cargo carried. It is regretted that the figures for 1894 are not yet obtainable:

Month.	Number.	Tonnage.	Actual cargo.	Month.	Number.	Tonnage.	Actual cargo.
			Tons.				*Tons.*
January	1,103	715,484	323,233	August	1,481	742,691	386,853
February	1,130	697,600	317,185	September	1,294	738,621	366,361
March	1,372	796,770	405,426	October	1,414	839,609	421,142
April	1,392	829,528	437,176	November	1,215	787,501	465,305
May	1,441	884,212	431,309	December	1,410	832,388	481,544
June	1,313	833,029	479,459				
July	1,420	757,116	423,686	Total	15,985	9,454,549	4,920,679

PASSENGER RATES FROM MARSEILLES.—The following table will indicate the cost of passage from Marseilles to the points named:

Name of city.	First class.	Second class.	Third class.	Name of city.	First class.	Second class.	Third class.
Yokohama	$331.00	$222.00	$122.00	Rodosto	$48.00	$33.00	$11.00
Kobe	331.00	222.00	122.00	Soolina	67.00	50.00	15.00
Shanghai	331.00	222.00	122.00	Genoa	5.79	3.86	1.50
Hongkong	331.00	222.00	122.00	Agde	2.30	1.50	1.15
Saigon	299.00	198 00	109.00	Ajaccio	5.79	3.86	1.93
Haiphong	331.00	221.00	122.00	Bastia	5.79	3.86	1.93
Samarang	299.00	198.00	109.00	Bonifacio	8.72	5.40	3.08
Batavia	299.00	198.00	109.00	Calvi	5.79	3.86	1.93
Singapore	270.00	179.00	98.00	Ile Russe	5.79	3.86	1.93
Calcutta	241.00	160.00	88.00	Propriano	6.94	4.82	2.70
Madras	241.00	160.00	88.00	Porto Torres	10.80	8.68	4.82
Pondicherry	236.00	157.00	86.00	Toulon	1.54	1.15	.57
Colombo	231.00	154.00	84.00	Nice	5.79	3.86	1.54
Noumea	361.00	221.00	110.00	Cannes	2.89	1.93	1.15
Sydney	313.00	193.00	96.00	Naples	17.37	13.51	3.08
Melbourne	313.00	193.00	96.00	Leghorn	9.65	6.75	2.89
Adelaide	313.00	193.00	96.00	Cette	1.93	1.54	.96
King George	313.00	193.00	96.00	La Nouvelle	2.89	1.93	1.54
Mauritius	241.00	183.00	91.00	Barcelona	9.65	3.86	.....
Reunion	241.00	183.00	91.00	Malaga	28.95	10.80	.....
Tamatave	236.00	176.00	88.00	Teneriffe	48.00	33.00	19.30
St. Marie	236.00	173.00	86.00	Algiers	19.30	13.51	5.79
Diego Suarez	231.00	168.00	84.00	Bone	19.30	13.51	5.79
Bombay	241.00	160.00	88.00	Arzew	21.23	14.47	6.75
Kurrachee	226.00	150.00	82.00	Bougie	19.30	13.51	7.14
Nossi Be	227.00	165.00	82.00	Collo	19.30	13.51	7.14
Mayotte	220.00	160.00	80.00	Dellys	19.30	13.51	6.36
Zanzibar	212.00	154.00	77.00	Djidjelli	19.30	13.51	7.14
Aden	168.00	111.00	61.00	Gibraltar	30.88	23.16	12.54
Obock	164.00	109.00	59.00	La Calle	19.30	13.51	8.72
Suez	86.00	65.00	32.00	Melilla	26.05	20.26	9.65
Port Said	77.00	57.00	28.00	Mostaganem	21.23	14.47	6.94
Alexandria	57.00	40.00	17.00	Nemours	22.19	15.44	8.10
Alexandretta	84.00	57.00	21.00	Oran	19.30	13.51	5.79
Batoum	62 00	.....	.....	Philippeville	19.30	13.51	5.79
Beyrout	77.00	54.00	21.00	Tangiers	32.81	25.09	13.51
Calamata	34.00	.....	.....	Tunis	24.12	18.33	9.65
Constantinople	43.00	28.00	9.00	Malta	36.67	26.05	15.04
Dardanelles	42.00	28.00	9.00	Bizerte	27.98	21.23	11.96
Jaffa	71.00	50.00	20.00	Djerba	38.60	27.98	16.40
Larnaca	77.00	52.00	20.00	Gabes	36.67	27.40	15.05
Latakeea	84.00	60.00	23.00	Mehdia	31.84	23.16	12.73
Mersina	81.00	54.00	21.00	Monastir	29.91	22.58	12.54
Piree	36.00	23.00	7.00	Sfax	35.70	27.02	14.47
Salonica	48.00	32.00	13.00	Soussee	28.95	22.19	12.54
Smyrna	38.00	28.00	9.00	Cartagena	21.80	15.82	8.87
Syra	36.00	.....	.....	Las Palmas	57.90	48.25	19.30
Tripoli	82.00	57.00	22.00	Dakar	132.20	110.01	46.32
Kerassunde	57.00	.....	.....	Conakry	144.75	121.59	48.25
Odessa	57.00	.....	.....	Sierra Leone	149.57	125.45	52.11
Trebizonde	59.00	38.00	14.00	Grand Bassam	173.70	135.10	63.69
Samsoun	53.00	36.00	13.00	Elmina	173.70	135.10	63.69
Novorossisk	67.00	44.00	17.00	Accra	173.70	135.10	63.69
Braila	72.00	52.00	16.00	Catonon	193.00	164.05	67.55
Dedeah	48.00	32.00	11.00	Libreville	212.30	173.70	73.34
Galatz	72.00	52.00	16.00	Loango	231.60	189.14	79.13
Gallipolis	48.00	33.00	11.00				

Except to the last-named points, on the west coast of Africa, passenger traffic from Marseilles to the Atlantic is so inconsiderable that it is not deemed necessary to give passenger rates for other points. The passage for emigrants for New York charged by the Marseilles companies from Marseilles and Naples is from $19.30 to $27.98.

It must be remembered that the above table of passenger rates is compiled from the offices of the companies furnishing the most desirable accommodations, and the figures given are for the best obtainable service for the respective classes. Other companies reaching the various points above enumerated charge a much lower price; in some instances, notably Algiers, the difference is as great as 50 per cent.

OCEAN FREIGHT RATES.—In the matter of freight rates, it is virtually impossible to present figures of value. Each company has practically the same rate as others for any particular point, but there is a different rate for almost every article of merchandise. Some goods are handled by the kilo or the 100 kilos; others, entirely by the ton. Then, too, under the French system, while in weight 1,000 kilos is a ton, certain classes of goods are only accepted by cubic measurement —50 cubic feet of space being estimated as 1 ton. Light merchandise, such as almonds, occupying a ton of space, really weigh only about 600 kilos (1,323 pounds). In a general way, it may be stated that the cost of shipment from Marseilles to Constantinople and the neighboring Mediterranean and Black Sea ports varies from 20 to 35 francs ($3.96 to $6.75) per ton, depending, of course, on the character of the merchandise.

For China, Japan, and the far East, the cost of freight for general merchandise varies from 35 to 45 francs ($6.75 to $8.68) per ton; for such goods as cement, lime, etc., from 20 to 25 francs ($3.96 to $4.82) per ton; for heavy goods, such as structural iron, from 25 to 30 francs ($4.82 to $5.79) per ton.

For the west coast of Africa, the rates vary from 20 to 30 francs ($3.96 to $5.79); for Bordeaux and the west coast of France, from 15 to 18 francs ($2.90 to $3.47) per ton.

2. HAVRE.

OCEAN LINES.—Next to Marseilles, the great ocean port of France is Havre, which is the chief point of arrival and departure for all the direct traffic between France and the United States. The arrivals and departures during 1894 represented an aggregate tonnage of 3,742,410, or nearly 17 per cent of the total of France.

The following companies operate regularly from the port of Havre:

Compagnie Générale Transatlantique.—The Atlantic and coastwise fleets of the company running from Havre and St. Nazaire consist respectively of twenty-five and thirteen vessels, with the following tonnage and horsepower:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Atlantic line:			Atlantic line—continued.		
La Touraine	9,132	12,000	Colombie	2,876	1,800
La Champagne	7,277	9,000	Ville de Bordeaux	2,670	2,600
La Bretagne	7,302	9,000	Intercolonial service:		
La Bourgogne	7,630	9,000	Ville de Tanger	1,066	700
La Gascogne	7,630	9,000	Salvador	1,011	700
La Navarre	6,959	7,000	St. Dominique	1,011	700
La Normandie	6,485	6,500	Coastwise service.		
Amérique	4,525	3,300	Alexandre Bixio	2,253	1,100
France	4,550	3,300	Flachat	2,253	1,100
Labrador	6,670	3,300	Fournel	2,187	1,300
Canada	4,287	3,300	La Gard	1,775	1,500
St. Laurent	4,132	3,300	Le Tarn	1,775	1,500
Versailles	4,336	4,200	Le Calvados	1,775	1,500
St. Germain	3,641	3,100	Désirade	1,452	1,200
Lafayette	3,394	3,800	Malvina	1,245	950
Washington	3,401	1,700	Le Morbihan	1,182	700
Olinde Rodrigues	3,188	1,700	Manoabia	1,080	900
St. Simon	3,137	1,700	Colomba	836	550
Ferdinand de Lesseps	2,920	1,800	Dragut	536	550
Ville de Marseille	2,836	1,800	Mustapha ben Ismail	556	500

This company operates lines from Havre as follows:

(1) For New York. Departures and arrivals every Saturday.

(2) For the island of Hayti, via St. Nazaire and Bordeaux, touching at St. Thomas, St. Juan de Porto Rico, Puerto Plata, Cape Haytien, Port au Prince, St. Marc, Gonaives; direct connections for Ponce, Mayaguez, Santo Domingo, Jacmel, Petit Goave, Jeremie, and Aux Cayes. Arrivals and departures monthly.

(3) For Colon, via Bordeaux, touching at Santander, Guadeloupe, Martinique, Trinidad (Bolivar), Carupano, La Guayra, Puerto Cabello, and Sabanilla. Arrivals and departures monthly.

Compagnie des Chargeurs Réunis.—This company, organized in 1872, possesses a fleet of thirty-four steamers of the first class (of which two are under construction) with an aggregate tonnage of 90,159 and a collective horsepower of 42,000. The following are the names of these vessels, with the tonnage and horsepower of each:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Paraguay	3,562.55	1,900	Paranagua	2,184.33	1,250
Rio Negro	3,382.51	1,550	Ville de Ceara	2,308.31	1,200
Uruguay	3,399.17	1,550	Villa de Pernambuco	2,169.75	1,000
Pampa	3,021.47	1,300	Villa de Rosario	2,119.02	1,000
Dom Pedro	3,014.98	1,300	Villa de San Nicolas	2,119.02	1,000
Porteña	2,355.05	1,200	Villa de Montevideo	2,119.03	1,000
Canarias	3,354.47	1,450	Villa de Buenos Aires	2,119.02	1,000
Caravellas	3,354.47	1,450	Villa de Maranhâo	2,543.77	1,200
Concordia	3,076.44	1,450	Villa de Maceio	2,543.77	1,200
Colonia	3,076.44	1,450	Sergent Malamine (annex)	101.57	130
Campana	3,076.44	1,450	Éclaireur (annex)	101.90	80
Corrientes	3,076.44	1,450	Mosca (tug)	81.15	160
Corsica	3,076.44	1,450	New steamers:		
Colombia	3,076.44	1,450	Carolina	3,616.33	1,500
Cordoba	2,933.90	1,400	California	3,616.33	1,500
Entre Rios	2,893.64	1,400	Under construction:		
Santa Fé	2,893.64	1,400	Cordilleras	3,354.47	1,450
Parahyba	2,682.70	1,400	Campinas	3,354.47	1,450

This company operates four distinct lines from Havre, viz:

(1) For New Orleans, via Antwerp and Bordeaux. Arrivals and departures monthly.

(2) For the west coast of Africa (subventioned postal service), Teneriffe, Dakar, Conakry, Sierra Leone, Grand Bassam, Cotenou, and the French Congo. Arrivals and departures bimonthly.

(3) For Brazil, direct, via Lisbon to Pernambuco, Maceio, Bahia, Rio de Janeiro, Santos, with connections at Rio de Janeiro for Paranagua, St. Catherine, Rio Grande do Sul, Victoria, Pelotas, and Porto Alegre. Arrivals and departures four times per month—twice in the Havre, Lisbon, Rio de Janeiro and Santos service, and twice in the Rio de Janeiro service via Pernambuco, Maceio, and Bahia.

(4) For the River Plate, leaving Havre the 10th, 20th, and 30th of each month, via Bordeaux (boats of the 10th and 20th only) and Teneriffe, to Montevideo and Buenos Ayres.

Compagnie Havraise Péninsulaire de Navigation à Vapeur.—Regular line of steamers for Majunga, Diego Suarez, and Tamatave (Madagascar), Port Louis (Mauritius), and La Reunion.

Service Maritime de la Maison Worms, Josse & Co.—This company, engaged in the coastwise service, has a fleet of thirteen vessels, with an aggregate tonnage of 19,200, as follows:

Name.	Tonnage.	Name.	Tonnage.
Suzanne et Marie	2,000	Commandant Franchetti	1,200
Sephora Worms	2,000	Marguerite Franchetti	1,200
Emma	2,000	Blanche	1,200
Thérèse et Marie	2,000	Marie	1,200
Lucie et Marie	2,000	Ville de Nantes	1,000
Hippolyte Worms	1,500	Président	700
Frédéric Franck	1,200		

This company operates the following services from Havre:

(1) For Bordeaux and intermediate points. Depart every Tuesday and Friday.

(2) For Hamburg. Departs every Friday.

(3) For Brest, Tonnay, Rochefort, and La Rochelle and Pallice. Departures and arrivals alternate Saturdays.

Jens, Meinich & Co.—This firm operates a regular line of steamers between Rouen and Havre and Christiania (Norway).

Havre-Bilbao lines.—Regular service between Havre and Bilbao for all points in Spain.

Chevillotte Frères.—Regular lines between Havre, Brest, and Nantes. Arrivals and departures every alternate day.

Compañía Transatlántica.—Regular service between Havre and Havana and Vera Cruz.

In addition to the foregoing, the vessels of the Hamburg South American Steamship Company touch monthly at Havre en route to Paranagua, Desterro, Rio Grande do Sul, and all points in southern Brazil.

There is a daily service with Southampton, making close connections with steamers of the American and North German Lloyd lines for New York, and with other lines from that port.

There is a direct service to Liverpool in connection with the Cunard, White Star, and other steamers sailing from that port for New York, Boston, and other ports in the New and Old World.

PASSENGER RATES FROM HAVRE.—The following shows the rates of passage now current from Havre to the points named:

Havre to—	First class.	Second class.	Third class.	Havre to—	First class.	Second class.	Third class.
Liverpool	$8.22		$5.16	Havana	$164.05 to 183.34	$135.10	$86.60
Hamburg	11.58		5.79	Vera Cruz	193.00 to 212.30	164.05	86.60
New Orleans			36.32	Tamatave	259.58	192.22	99.00
Christiania	22.00			Port Louis	393.72	285.83	164.63
Southampton	5.56	$4.20	2.57	Montevideo	144.75	67.55	28.95
London	6.64	4.83	3.63	Buenos Ayres	144.75	67.55	28.95
Antwerp			6.37	Pernambuco			28.95
St. Thomas	178.70 to 193.00	154.40	86.60	Rio de Janeiro			28.95
Santo Domingo	183.34 to 212.30	154.40	86.60	Dakar	144.75	119.66	57.90
Port au Prince	183.34 to 212.30	154.40	86.60	Lisbon	23.16		
Colon	183.34 to 212.30	154.40	86.60	Bilbao	11.58	8.66	5.79

Havre to New York.—Compagnie Générale Transatlantique: Summer rates, first class $96.59 to $193, second class $57.90; winter rates, first class $77.20 to $154.40, second class $57.90, third class $13.37. Hamburg-American Line: Summer rates, first class $60.22 to $72.68, second class $57.90, third class (French, Italian, Swiss, and Spanish emigrants)—adults $17.37, children 1 to 12 years $8.69, infants $2.18; emigrants of other nationalities—adults $29.95, children $14.98, infants $2.18; winter rates, first class $54.28 to $60.22, second class $57.90, steerage, same as summer rates. American Line: First class, $100 to $172; second class, $42.40; third class, $19.30.

Round-trip tickets, good for from ten days to a year according to the distance, are sold at an average discount of from 20 to 33⅓ per cent from the rates quoted.

OCEAN FREIGHTS.—It is not possible to state with any exactness the rates for ocean freights, because they are constantly fluctuating and vary according to the classification of the merchandise, the country to or from which it is transported, the kind of vessel by which it is shipped, the ebb and flow of the demand for tonnage on given lines, etc.

3. BORDEAUX.

OCEAN LINES.—The third French port in point of importance is Bordeaux. The arrivals and departures during 1894 numbered 2,733, representing an aggregate tonnage of 1,789,827. The following are the principal companies operating lines from Bordeaux:

Compagnie des Messageries Maritimes.—The Atlantic fleet of this company, running from Bordeaux, is composed of thirteen vessels whose names, tonnage, and horsepower are:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Brésil	5,809	5,400	Dordogne	3,750	2,200
La Plata	5,676	5,400	Adour	3,730	2,200
Portugal	5,430	4,800	Matapan	3,657	1,900
Equateur	3,856	2,900	Corduan	3,641	1,900
Orénoque	3,832	2,900	Chili	3,234	6,000
Congo	3,831	2,900	Under construction	3,234	6,000
Charente	3,774	2,200			

The services of this company from Bordeaux are:

(1) For Lisbon, Dakar, Rio de Janeiro, Montevideo, Buenos Ayres. Departures the 5th of every month.

(2) For Vigo, Lisbon, Dakar, Pernambuco, Bahia, Rio de Janeiro, Montevideo, and Buenos Ayres. Departures the 20th of each month.

(3) For Pasoges, La Corogne, Vigo, Porte Leixoes, Lisbon, Pernambuco, Bahia, Rio de Janeiro, Santos, Montevideo, Buenos Ayres (commercial service of cargo boats, with stoppages as desired by shippers). Departures the 28th of each month.

Chargeurs Réunis.—The services of this line from Bordeaux (Panillac) are:

(1) For New Orleans. Departures the 30th of each month.

(2) For all points on the west coast of Africa, as stated under the head of Havre. Departures from Bordeaux the 10th of each month.

(3) For Teneriffe, Montevideo, and Buenos Ayres. Departures semi-monthly.

Nouvelle Compagnie Bordelaise de Navigation.—The fleet of this company is composed as follows:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Château-Lafitte	3,462	2,000	Thomas Anderson	2,533	1,000
Panama	2,118	1,000	Ardoncorraet	1,432	700
Wallachia	1,724	850	Gladiolus	1,941	1,000

The services are:

(1) Regular service between Bordeaux and New York by the *Château-Lafitte* and the *Panama* (only the former carrying passengers). Departures from Bordeaux monthly or oftener.

(2) Freight service between Bordeaux, New York, and Baltimore.

Compagnie Havraise Péninsulaire de Navigation à Vapeur.—This line runs from Havre, via Bordeaux and Marseilles, to Madagascar ports, Mauritius, and La Reunion. Departures from Bordeaux monthly.

General Steam Navigation Company.—This company performs a regular weekly service between Bordeaux and London, with the steamers *L'Hirondelle* and *Le Pérégrin*, of 800 tons each, and of 400 and 600 horsepower respectively. Departures every Friday; arrivals every Monday.

La Société Générale des Transports Maritimes à Vapeur de Marseille.—A bimonthly service is performed between Bordeaux and Algiers with the steamers *Berry* (864 tons, 1,400 horsepower), and *Jeanne d'Arc* (749 tons, 700 horsepower).

Bordeaux-Liverpool Company.—This company performs a weekly service between Bordeaux and Liverpool, with the steamers *La Gascogne* and *Guienne* (1,150 tons and 600 horsepower each). Departures from Bordeaux every Thursday.

Compagnie des Bateaux à Vapeur du Nord.—This company performs a regular coastwise service between Bordeaux, Dunkirk, La Pallice, St. Nazaire, Marseilles, and Cette. Departures from Bordeaux every six days.

Compagnie Royale Néerlandaise de Navigation à Vapeur.—The steamers of this company sail from Bordeaux for Amsterdam and intermediate ports every alternate Tuesday.

PASSENGER RATES.—The following shows the current passenger rates from Bordeaux to leading ports in different parts of the world:

Passenger rates on the Atlantic Ocean Line (Compagnie des Messageries Maritimes)

OUTWARD VOYAGE.

[In francs, 1=19.3 cents.]

To—	From— Bordeaux.	La Corogne.	Vigo.	Lisbon.	Dakar.	Pernambuco.	Bahia.	Rio Janeiro.	Montevideo.
La Corogne:									
First class	150	.....	.....	.....	.....	.....	.....	.....	.....
Second class	100	.....	.....	.....	.....	.....	.....	.....	.....
Third class	50	.....	.....	.....	.....	.....	.....	.....	.....
Vigo:									
First class	150	.....	.....	.....	.....	.....	.....	.....	.....
Second class	100	.....	.....	.....	.....	.....	.....	.....	.....
Third class	50	.....	.....	.....	.....	.....	.....	.....	.....
Lisbon:									
First class	155	100	100	.....	.....	.....	.....	.....	.....
Second class	105	75	75	.....	.....	.....	.....	.....	.....
Third class	55	25	25	.....	.....	.....	.....	.....	.....
Dakar:									
First class	700	650	650	540	.....	.....	.....	.....	.....
Second class	500	450	450	405	.....	.....	.....	.....	.....
Third class	250	250	250	225	.....	.....	.....	.....	.....
Pernambuco:									
First class	750	700	700	550	490	.....	.....	.....	.....
Second class	550	500	500	415	400	.....	.....	.....	.....
Third class	250	250	250	250	250	.....	.....	.....	.....
Bahia:									
First class	800	750	750	600	515	125	.....	.....	.....
Second class	550	500	500	450	425	100	.....	.....	.....
Third class	250	250	250	250	250	45	.....	.....	.....
Rio Janeiro:									
First class	850	800	800	750	610	250	200	.....	.....
Second class	600	550	550	500	445	188	150	.....	.....
Third class	250	250	250	250	250	70	50	.....	.....
Montevideo:									
First class	1,000	980	980	900	890	560	520	260	.....
Second class	700	685	685	650	650	420	345	160	.....
Third class	250	250	250	250	250	165	140	80	.....
Buenos Ayres:									
First class	1,000	980	980	900	890	600	550	280	42
Second class	700	685	685	650	650	450	375	180	33
Third class	250	250	250	250	250	175	150	80	21

Single passengers having the exclusive use of a double-berth stateroom, first class, are required to pay 70 per cent in addition to the price of such stateroom.

HOMEWARD VOYAGE.

To—	From— Buenos Ayres.	Montevideo.	Rio Janeiro.	Bahia.	Pernambuco.	Dakar.	Lisbon.	Vigo.	La Corogne.
Montevideo:									
First class	42	.....	.....	.....	.....	.....	.....	.....	.....
Second class	33	.....	.....	.....	.....	.....	.....	.....	.....
Third class	21	.....	.....	.....	.....	.....	.....	.....	.....
Rio-Janeiro:									
First class	280	260	.....	.....	.....	.....	.....	.....	.....
Second class	180	160	.....	.....	.....	.....	.....	.....	.....
Third class	80	80	.....	.....	.....	.....	.....	.....	.....
Bahia:									
First class	550	520	200	.....	.....	.....	.....	.....	.....
Second class	375	345	150	.....	.....	.....	.....	.....	.....
Third class	150	140	50	.....	.....	.....	.....	.....	.....
Pernambuco:									
First class	600	560	250	125	.....	.....	.....	.....	.....
Second class	450	420	188	100	.....	.....	.....	.....	.....
Third class	175	165	70	45	.....	.....	.....	.....	.....

Passenger rates on the Atlantic Ocean Line, etc.—Continued.

HOMEWARD VOYAGE—Continued.

[In francs, 1=19.3 cents.]

To—	From—								
	Buenos Ayres.	Monte-video.	Rio Janeiro.	Bahia.	Per-nam-buco.	Dakar.	Lisbon.	Vigo.	La Co-rogne.
Dakar:									
First class	890	890	610	515	490	.....	.....	.....	.....
Second class	650	650	445	425	400	.....	.....	.....	.....
Third class	250	250	250	250	250	.....	.....	.....	.....
Lisbon:									
First class	900	900	750	600	550	540	.....	.....	.....
Second class	650	650	500	450	415	405	.....	.....	.....
Third class	250	250	250	250	250	225	.....	.....	.....
Vigo:									
First class	980	980	800	750	700	650	100	.....	.....
Second class	685	685	550	500	500	450	75	.....	.....
Third class	250	250	250	250	250	250	25	.....	.....
La Corogne:									
First class	980	980	800	750	700	650	100	.....	.....
Second class	685	685	550	500	500	450	75	.....	.....
Third class	250	250	250	250	250	250	25	.....	.....
Bordeaux:									
First class	1,005	1,005	905	805	755	705	160	155	155
Second class	705	705	605	555	555	505	110	105	105
Third class	255	255	255	255	255	255	60	55	55

Single passengers having the exclusive use of a double-berth stateroom, first class, are required to pay 70 per cent in addition to the price of such stateroom.

In the ports of La Plata the passage money is paid in piastres at the rate of exchange fixed by the agency of the company.

The rates of the Compagnie des Messageries Maritimes from Bordeaux to other ports than the foregoing are: To New York, $60, first class; $30, second. To New Orleans, $30, third class (no first or second class, and line now discontinued). To London, $12.50, first class (meals, $5 extra); second class, $12; third class, $8 (meals included in both). To Liverpool, first class, $20; second class, $15; third class, $10. To Amsterdam, first class, $15 (no second or third class).

Steamers to Tamatave, Mauritius, and Reunion carry only freight.

The company issues round-trip tickets, good for one year, from Bordeaux for the following Atlantic Ocean ports:

Port.	First class.	Second class.	Port.	First class.	Second class.
Dakar	$203.62	$155.37	Rio Janeiro	$247.04	$186.25
Pernambuco	218.09	170.81	Montevideo	290.47	216.12
Bahia	232.57	170.81	Buenos Ayres	290.47	216.12

FREIGHT RATES.—The current quotations for freight to New Orleans and other points in the South and West, as made by the Compagnie des Chargeurs Réunis, are:

From Bordeaux and Havre to New Orleans, per cubic meter or 700 kilograms (35.317 cubic feet or 1,543 pounds), for all merchandise (at the choice of the ship), without primage, $3.96.

From Bordeaux to New Orleans, per wine cask of Bordeaux, wine in casks, $9 and 10 per cent.

Wine in cases, spirits, liquors (240 bottles to the cask), and preserves, $7 and 10 per cent.

Glassware in crates, faïence, and mineral water, $5.50 and 10 per cent.

Merchandise for New Orleans, in transit, is accepted at Bordeaux at the uniform rate of $6 per cask per ton. (Bill of lading direct for New Orleans, transshipment being made by the consignees.)

The following are the rates for shipments direct from Havre, Antwerp, and Bordeaux for the following points (via New Orleans), and per cask of 40 cubic feet or 1,000 kilograms (2,204 pounds), at the choice of the ship, without primage:

Ports.	First class.	Second class.	Third class.
To San Francisco, Portland, Oreg., and Los Angeles	$23.16	$21.23	$19.30
To San Francisco, Portland Oreg., and Los Angeles, from Havre and Bordeaux only:			
Per cubic meter or 700 kilograms	15.44	15.44	15.44
Wine in casks, per 4 Bordeaux casks	21.23	21.23	21.23
Champagne, per cask of 240 bottles	19.30	19.30	19.30
To Corpus Christi, Brazos, and Brownsville, for merchandise not above 600 kilograms, per cubic meter	24.13	24.13	24.13
To Eagle Pass, El Paso, and Laredo, freight for New Orleans, per cubic meter or 700 kilograms (1,543 pounds), plus $1.32 per £100 ($486.60) for all merchandise			
To Galveston	11.58	11.58	11.58

For New Orleans: Specie and other money values, one-half of 1 per cent; minimum freight, 20 francs ($3.86). For other destinations: Minimum freight, 50 francs ($9.65). Champagne wine is rated per cask of 240 bottles.

The Nouvelle Compagnie Bordelaise de Navigation makes average rates on general merchandise from Bordeaux to New York of 20 francs ($3.86) per ton, and from New York to Bordeaux of 30 francs ($5.79) per ton. The rates vary, however, according to the season and the quantity and nature of the merchandise. For general merchandise, current rates between Bordeaux and London are 12 shillings ($2.93) and 10 per cent, and between Bordeaux and Liverpool 15 shillings ($3.64) and 10 per cent.

The Compagnie des Chargeurs Réunis makes the following quotations on merchandise to South America, which are subject to frequent changes:

To—	General merchandise per cubic meter or 500 kilograms (1,102 lbs.).		Merchandise from Bordeaux per ton.		Potatoes per 900 kilograms (1,984 lbs.).		Wine in casks (cask of Bordeaux).		Spirits in casks (cask of Bordeaux).	
	Rate.	Per cent.	Rate.	Per cent.	Rate.	Per cent.	Rate.	Per cent.	Rate.	Per cent.
Pernambuco, Maceio, and Bahia	$10.23	10	$13.51	10	$13.51	10	$16.40	10	$18.33	10
Rio de Janeiro	8.69	10	12.55	10	12.55	10	15.44	10	17.37	10
Santos	11.58	10	13.51	10	13.51	10	16.40	10	18.33	10
Montevideo and Buenos Ayres	6.75	10	6.75	Dry.	7.72	10	8.69	Dry.	10.62	Dry.
Rosario	8.69	10	8.69	Dry.	9.65	10	10.62	Dry.	13.51	Dry.

Port charges are additional. Discounts of from 5 to 10 francs ($0.965 to $1.93) per ton are allowed on large shipments for La Plata.

The same company quotes freights to the west coast of Africa at 25 to 55 francs ($4.93 to $10.62) per ton, according to the classification and quantity of merchandise and the destination.

Bordeaux to Algiers, general merchandise 20 to 25 francs ($3.96 to $4.93) per ton.

4. DUNKIRK.

OCEAN LINES.—The fourth port of France in importance is Dunkirk. The following very complete exhibit, prepared by Mr. Benjamin Morel, United States consular agent at Dunkirk, shows the names of all the companies serving that port; names, tonnage, and horsepower of their vessels; services, passenger and freight rates, and dates of sailing:

Regular lines of steamers running from and to Dunkirk.

Companies and steamers.	Net tonnage.	Horsepower.	Dunkirk to—	Freight per ton.	Fare.	Sailings.
Compagnie Générale des Vapeurs du Nord:						
Neva	171	60	Havre	$0.96½	$1.93 to 3.86	Wednesdays.
Jean Bart	395	80	Bayonne via Rouen.	1.93	3.86 to 9.65	Fortnightly.
Marie	461	100	Boulogne	1.93	3.86 to 9.65	Weekly.
Ville de Boulogne.	473	120	L'Orient, La Pallice.	1.93	3.86 to 9.65	Do.
Nord	547	90	La Rochelle and Bordeaux.	1.93	3.86 to 9.65	Do.
Ville de Lisle	590	90	Bordeaux, Cette, Port Vendres, Marseilles, Tunis, Bizerta, Sousse Bone, Algiers, and Philippeville.			
Cambrai	611	120	.....do			
Ville de Dunkerque.	756	150	.....do			
N. Verheckmoës.	777	170	.....do	2.90	9.65 to 19.30	Do.
President Leroy Lallier.	750	160	.....do			
Ville de Marseille.	799	200	.....do			
Frédéric Morel.	822	160	.....do			
Nantes-Bordeaux.	880	225	.....do			
Ville d'Arras	985	250	.....do			
Bossut-lichon:						
St. Jean	244	50	Boulogne, Havre, Brest, Lorient, Nantes, Rochefort, La Pallice, and Bordeaux.	2.98½	3.86 to 9.65	Do.
St. Andrié	313	60	.....do			
Jeanne d'Arc	361	70	.....do			
Noël Dubuisson:						
René	583	140	Havre, St. Nazaire, Bordeaux, Marseilles, Algeria, and Tunis.			Monthly.
Marguerite	651	120	.....do			
Antillon	849	160	.....do			
Noël	1,030	180	.....do			
G. Beck:						
Emilie	470	125	.....do	2.89½	9.65 to 19.30	Irregularly.
Compagnie Havraise Péninsulaire, Havre:						
Ville de Malaga.	882	150	.....do			Weekly.
Ville de Riposto.	855	130	.....do			
Ville de Messine.	797	130	.....do			

Regular lines of steamers running from and to Dunkirk—Continued.

Companies and steamers	Net tonnage	Horse power.	Dunkirk to—	Freight per ton.	Fare.	Sailings.
Compagnie Générale Transatlantique Havre:						
Le Morbihan	506	200	Havre, St. Nazaire, Bordeaux, Marseilles, Algeria, and Tunis	2.89½	9.65 to 19.30	Irregularly.
Le Gard	779	300	do			
Le Tarn	787	300	do			
Le Calvados	787	300	do			
Fournel	1,217	220	do			
Alexandre Bixio.	1,473	180	do			
Flachat	1,495	280	do			
Messageries Maritimes, Marseilles:						
Cordouan	2,094	350	Australasia and River Plate.			
Adour	2,154	350	do			
Ortégal	2,631	350	do	*a* 2.20	*a* 96.50, 193.00	
Dordogne	2,636	525	do	*b* 2.89½	and 231.60	Do.
Matapan	2,648	350	do	to 3.47	*c* 77.20 to 193.00	
Médoc	2,648	350	do			
Charente	2,693	525	do			
Armand Béhic	2,822	1,000	do			
Société Anonyme de Denain and Anzin:						
Galindo	424	144	Havre and Bilbao	1.64	5.79 to 11.58	Fortnightly.
San Martin	733	190	do			
Devés and G. Chaumet, Bordeaux:						
Cayor	1,025	140	Senegal	3.47	15.44 to 25.00	Monthly.
Chevillotte Fréres, Brest:						
Amérique	258	40	River Plate	*b* 3.09	77.20, 115.87	Frequently during the season.
Penfeld	472	90	do	to 3.47	and 154.89	
Charles	478	124	do			
Compagnie des Chargeurs Réunis, Havre:						
Ville de Maranhao.	1,402	300	do			
Ville de Maceio.	1,402	300	do			
Ville de Céara	1,699	300	do			
Portena	1,374	300	do			
Belgrano	1,602	150	do			
Campagna	1,616	360	do			
Colombia	1,616	500	do			
Colonia	1,616	360	do			
Corsica	1,616	360	do	*b* 3.09	77.20, 115.80	Do.
Concordia	1,616	360	do	to 3.47	and 154.89	
Caravellas	1,625	365	do			
Entre Rios	1,661	350	do			
Santa Fé	1,661	350	do			
Cordoba	1,675	250	do			
Dom Pedro	1,834	325	do			
Rio Negro	1,970	387	do			
Parahyba	1,986	160	do			
Uruguay	2,002	387	do			
Paraguay	2,012	500	do			
Allan Line, Glasgow.*d*	1,252–3,133	220–300	do			
Lamport & Holt, Liverpool.*d*	812–2,052	125–300	do			
J. Hoult, Liverpool.*d*	943–2,297	110–300	do	3.09 to 3.47	77.20, 115.80 and 154.89	Frequently.
R. P. Houston & Co., Liverpool.*d*	1,922	164–350	do			
Watts & Co., London.*d*	910–2,111	150–300	do			

a Australia.

b River Plate in cubic meters = 35.317 cubic feet.

c River Plate.

d The names, tonnage, and horsepower of the several steamers belonging to these lines are not given. The tonnage and horsepower given represent the highest and lowest of the steamers of each line.

Regular line of steamers running from and to Dunkirk—Continued.

Companies and steamers.	Net tonnage.	Horsepower.	Dunkirk to—	Freight per ton.	Fare.	Sailings.
Houlder Bros., London.*a*	1,550–2,221	150–500	River Plate and Australia.			
Gellatly & Co., London.*a*	632–2,064	110–350	.....do			
Milburn & Co., London.*a*	561–3,014	98–650	.....do	*b* 3.09 *d* 2.20	*c* 145.98 *g* 145.98 to 195.00	Frequently.
W. Lund, London.*a*	1,786–2,778	400–650	.....do			
McDougall, Greenock.*a*	976–2,175	270–450	.....do			
Greenshields, Cowie, & Co., Liverpool.*a*	2,241–4,129	350–750	Bombay			
Rankin & Co., Liverpool.*a*	1,362–2,787	320–375	.....do			
Thompson, Liverpool.*a*	1,692–2,823	300–360	.....do			
Hamilton, Fraser & Co., Liverpool.*a*	1,845–2,668	300–500	.....do	*b* 3.09 to 3.47	145.98	Do.
Alexander & Co., Liverpool.*a*	1,689–2,744	300–400	.....do			
Cayrew, Irvine & Co., Liverpool.*a*	1,330–2,619	250–475	.....do			
Mead, Son & Hussey, London:						
Cassel	257	90	London	1.34	2.43	Two or three times a week.
Rosendael	259	95	.....do	1.34	2.43	Do.
Carey & Sons, London:						
Sir Robert Peel.	229	54	.....do	1.34	2.43	Triweekly.
Goole Steamship Co.:						
Aire	324	130	Goole	1.46	2.91	Semiweekly.
T. Wilson, Hull:						
Humber	386	90	Hull	1.46	2.91	Do.
Gibson & Co., Leith:						
Abbottsford ...	656	100	Leith	1.70	3.65	Do.
Antiquary	669	100	.....do			
Cork Steamship Co.:						
Egret	672	175	Liverpool	2.43	3.65	Weekly.
Duin Kerskshe:						
Stoomb Reedery.						
Vollenhoeven..	128	30	Rotterdam	.97	2.43	Do.
Koch & Co., Copenhagen:						
Pan	658	100	Baltic	1.70	12.15	Fortnightly.
H. Carl, Copenhagen:						
Dan	925	160	.....do	1.70	12.15	Do.
E. Pederson, Rostock:						
Theodor Burchard.	569	75	Germany	1.45	9.73	Monthly.
Companhia Thetis, Libson:						
Rio Tejo	563	30	Lisbon	1.93	13.51	Do.

a The names, tonnage, and horsepower of the several steamers belonging to these lines are not given. The tonnage and horsepower given represent the highest and lowest of the steamers of each line.

b River Plate, per cubic meter = 35.317 cubic feet.

c River Plate.

d Australia.

5. Boulogne.

Ocean lines.—Boulogne ranks next in importance among the French ports.

The Northern Railway Company of France runs fifteen express trains daily to this port, and a large number of freight trains, transporting a great number of passengers and enormous quantities of freight between the United Kingdom and all points in France and on the Continent.

The Southeastern Railway Company operates a line of steamers between Boulogne and Folkestone, with two departures daily from each port. The fleet is composed of the *Albert Victor*, *Mary Beatrice*, *Louise Dagmar*, *Achille*, *Adam*, *Elborall*, *Folkestone*, and *Boulogne*.

The Bennett Steamship Company runs a line of five steamers from Boulogne to London and Goole, names and tonnage as follows:

Vessel.	Tons.	Vessel.	Tons.
Burma	700	India	368
Malta	676	Not yet launched	750
China	449		

There are three departures per week for Goole and three for London, with corresponding arrivals. The Goole steamers can call at Hull, and there are also supplementary boats when traffic requires it, as often happens. The company is prepared to ply between Boulogne and any port in England.

The Compagnie Générale des Bateaux à Vapeur à Hélice du Nord, of Dunkirk, performs a weekly service between Boulogne and Bordeaux, calling at Lorient, Rochefort, La Rochelle, and St. Nazaire.

The steamers of the Netherlands Company, from Rotterdam to New York, call regularly at Boulogne on their weekly outward and homeward trips. The fleet in this service is composed as follows:

Vessel.	Tons.	Vessel.	Tons.
Spaardam	4,368	Obdam	3,657
Maasdam	3,984	Werkendam	3,657
Veendam	4,036	Rotterdam	3,329
Amsterdam	3,629		

During the summer, the Palace Steamer Company runs daily a large steamer between London, Ramsgate, and Boulogne, via Gravesend.

In addition to the foregoing, Boulogne is served by various lines of steam and sailing vessels running to all the principal French and English and North Sea ports.

Passenger rates from Boulogne are:

Port.	First class.	Second class.	Third class.	Port.	First class.	Second class.	Third class.
New York	$71.22	$48.25	$15.44	La Rochelle	$5.40	.....	$2.90
London:				Rochefort	5.40	.....	2.90
Winter	7.85	5.79	3.38	Bordeaux	5.79	.....	2.90
Summer *a*	2.31	1.83	.....	Bayonne	5.79	.....	2.90
L'Orient	4.82	.....	2.90				

a Palace steamers.

Freight rates from Boulogne are quoted at from 5 to 30 shillings ($1.22 to $7.30) per English ton to London, and from 10 to 20 francs ($1.93 to $3.86) to Bordeaux, the figures varying between the minimum and maximum stated, according to the nature of the merchandise, the season, etc.

6. Rouen.

The sixth port of France is Rouen; all the regular lines serving this port also serve Havre, and full particulars regarding them have already been given.

7. Calais.

Calais has become of recent years an important port. The Calais-Dover line between France and England carried in 1893, 226,234 passengers, and has transported in one year (1889) as many as 346,934 passengers. There are three daily mail services, each way, on this line, which includes fifteen steamers with an aggregate tonnage and horse-power of 3,165 and 5,175 respectively. There is also a weekly service between Calais and Goole by the Cooperative Wholesale Company's steamer *Nominal;* a regular service between Calais and London by the Vendroux line, and a petroleum tank line to Philadelphia, making about seven round trips per annum. Freights to London, 4 shillings to 5 shillings 6 pence (97.3 cents to $1.34) per ton.

8. La Pallice.

An important transportation service by both freight and passenger steamers is performed by the Pacific Steam Navigation Company, whose steamers between Liverpool and Brazil, the River Plate and the west coast of South America, put in regularly at the French port of La Pallice (La Rochelle). The fleet engaged in this service consists of fifteen vessels, with an aggregate tonnage of 64,611 and a total horse-power of 57,000, which arrive at and depart from La Pallice every fourteen days.

9. Miscellaneous Ocean Lines.

The various ocean and coastwise lines, enumerated in the foregoing, are owned by corporations, but most of them receive substantial subventions from the governments for the transportation of mails, and some of them are liberally subsidized, the condition being that their

ships shall be constructed with a view to their transformation into men of war in case of emergency, in which event they may be acquired by the government upon certain stipulated terms. In addition to the regular lines hereinbefore enumerated, there is a great number of vessels, mostly sailing craft, plying with more or less regularity between France and other countries in various parts of the world, either trading on their owner's private account, or chartered for special cargoes, or carrying freight (and sometimes passengers), as offered.

TOTAL ENTRANCES AND CLEARANCES AT FRENCH PORTS.

The official statistics of navigation show that, during the year 1893, 28,643 vessels of all kinds entered French ports, their aggregate tonnage being 13,853,844, while the number of departures was 29,382, with an aggregate tonnage of 14,168,482.

During the same period 2,402 vessels plying between foreign countries touched at French ports, to take on or discharge freight and passengers.

During the same year the arrivals and departures of vessels in the coastwise service aggregated 27,998, representing a total tonnage of 1,982,070. In the ocean and coastwise service to and from French ports there were therefore a grand total of 88,425 arrivals and departures of vessels of all kinds during the year 1893.

RAILWAYS.

The general railway system of France consists of seven principal systems, the designation of which, together with the mileage under operation on December 31, 1892, was as follows:

Name of system.	Length.	
	Kilometers.	Miles.
Nord (Northern)	3,612	2,244.49
Est (Eastern)	4,560	2,833.55
Ouest (Western)	5,172	3,215.88
Orléans (Orleans)	6,375	3,961.41
Paris-Lyon-Méditerranée (Paris, Lyons, and Mediterranean)	8,529	5,298.96
Midi (Southern)	3,037	1,887.19
État (State)	2,665	1,656.03
Total	33,950	21,095.51

Six of these systems are operated by independent corporations, holding special charters and concessions from the State. At the termination of these concessions, the lines and all the property of the several companies will pass into the possession of the Government. The interest on the shares and obligations of the several companies is guaranteed by the State upon certain conditions for a definite period. A specified revenue is reserved to the shareholders, and is guaranteed by the Government, so that, if the earnings of the systems, over and above operating expenses, are not sufficient to cover the amount so fixed, the deficit must be supplied from the national treasury.

For the six grand systems, the excess of revenue over and above the amount thus set aside for the shareholders is required to be paid to the Government in reimbursement of all advances made from time to time on account of the guarantees, with interest upon the same at the rate of 4 per cent per annum. After such reimbursement has been effected, certain fixed sums are payable to the shareholders, to which are added, in the case of the Northern Railway Company, variable sums, to be applied, under certain conditions, to the ultimate amortissement (redemption) of the shares.

The excess of revenue after this payment shall have been made is designated as net profits, of which two-thirds are to be payable into the national treasury and one-third to the shareholders. The subjoined table shows the date at which the several concessions expire, the dates from which the State reserved the right to resume the concessions (upon certain conditions), and the duration of the guarantees:

Name of company.	Date—		Expiration of guarantees.
	Of expiration of concession.	From which the State has the option to resume concessions.	
1. Northern	Dec. 31, 1950	Jan. 1, 1867	Dec. 31, 1914
2 Eastern	Nov. 26, 1954	Nov. 27, 1870	Dec. 31, 1934
3 Western	Dec. 31, 1956	Jan. 1, 1884	Dec. 31, 1935
4 Orleans	....do	Jan. 1, 1873	Dec. 31, 1956
5. Lyons and Mediterranean:			
Principal system	Dec. 31, 1958	Jan. 1, 1875	Dec. 31, 1914
Rhone to Mont Cenis	Dec. 31, 1955	Jan. 1, 1871	
6. Midi (Southern)	Dec. 31, 1960	Jan. 1, 1877	Dec. 31, 1960
7. Belt Railway, city circle	Dec. 11, 1952	.....	
8. Belt Railway	Dec. 31, 1958	.....	

The Ceinture and Grand Ceinture (belt railways) of Paris, which make a circle of the city and also connect it with all the immediate suburbs, comprising an aggregate length of 117 kilometers (72.7 miles), are also operated by syndicates, the one composed of the Northern, Western, Eastern, Orleans, and Lyons-Mediterranean companies, and the other of the same companies with the exception of the Western. The concessions for the ceinture lines will expire, respectively, December 11, 1952, and December 31, 1958.

All the systems mentioned in the foregoing have their headquarters in Paris, excepting the Midi, which has its chief offices at Bordeaux.

The réseau de l'état, or Government system, with a total mileage of 2,665 kilometers (1,656 miles) is operated directly by the State. The management of this system, as well as the close supervision of all the railways in the country, including local and suburban railways, industrial and mining railways, narrow-gauge lines, tramways, etc., is confided to the ministry of public works, one of the great departments of the Government, presided over by a minister of state.

The following are the termini of the several railroad systems and the important points touched by each:

NORD—MAIN LINES.

In kilometers, 1=0.62137 mile.

Termini and principal intermediate stations.	Distances.	Termini and principal intermediate stations.	Distances.
	Kilometers.		*Kilometers.*
Paris to Calais:		Paris to Calais:	
Creil	51	Arras	192
Amiens	131	Bethune	231
Abbeville	176	Hazebrouck	265
St. Valery	195	Dunkirk	305
Boulogne-sur-Mer	254	Calais	316
Calais	295	Paris to Maubeuge:	
Paris to Turcoing:		Compiegne	84
Longeau	126	St. Quentin	154
Arras	192	Aulnoye	216
Douai	218	Haumont	224
Lille	250	Maubeuge	229
Roubaix	255	Paris to Anor:	
Turcoing	257	Soissons	105
Paris to Valenciennes:		Laon	140
Aulnoye	216	Verains	179
Le Quesnoy	232	Herson	197
Valenciennes	251	Anor	205

NORD—PRINCIPAL BRANCH LINES.

Lille to Calais:		Arras to Boulogne sur Mer:	
Hazebrouck	47	St. Pol	39
Dunkirk	87	Etaples	100
Calais	197	Boulogne sur Mer	128
Laon to Rouen:			
Tergnier	5		
Amiens	80		
Rouen	117		

EST—MAIN LINES.

Paris to Avricourt:		Paris to Delle:	
Chateau Thierry	95	Troyes	167
Epernay	142	Bar sur Aube	221
Chalons sur Marne	173	Chaumont	262
Bar le Duc	254	Langres	297
Commercy	295	Vesoul	381
Toul	320	Lave	411
Nancy	353	Belfort	443
Luneville	386	Delle	465
Avricourt	412	Paris to Givet:	
Paris to Audun:		Epernay	142
Rheims	172	Rheims	172
Mezieres	260	Rethel	194
Sedan	276	Mezieres	244
Montmedy	325	Givet	308
Longuyon	346		
Audun	370		

EST—PRINCIPAL BRANCH LINES.

Chalindrey to Nancy:		Gretz to Vitry le Francois:	
Martigny les Bains	58	Coulommiers	72
Coutrexeville	68	Esternay	116
Vittel	73	Sezanne	132
Mirecourt	97	Vitry le Francois	203
Nancy	157		
Nancy to Gray:		St. Hilaire to Homecourt Joeuf:	
Epinal	74	Ste. Menehould	62
Vesoul	167	Verdun	107
Gray	225	Homecourt Joeuf	160
Nancy to Longwy:		Lerouville to Sedan:	
Pagny sur Moselle	38	Verdun	55
Ouville	46	Remilly	141
Longuyon	112	Pont Mangis	143
Longwy	128	Sedan	168

OUEST—MAIN LINES.

In kilometers, 1 = 0.62137 mile.

Termini and principal intermediate stations.	Distances.	Termini and principal intermediate stations.	Distances.
	Kilometers.		*Kilometers.*
Paris to Dieppe:		Paris to Dieppe:	
Pontoise	29	Oissel	126
Le Treport	119	Rouen	136
Neufchatel en Bray	134	Cleres	161
Dieppe	168	Dieppe	201
Paris to Havre:		Paris to Cherbourg:	
Mantes	58	Mantes	58
Vernon	80	Evreux	108
Oissel	126	Bernay	159
Rouen	140	Lisieux	191
Yvetot	178	Caen	239
Havre	228	Bayond	269
Paris to Brest:		Valognes	343
Versailles	17	Cherbourg	371
Chartres	88	Paris to Angers:	
Nogent le Rotron	149	Versailles	17
Le Mans	211	Chartres	88
Laval	301	Le Mans	211
Vitre	336	La Suze	230
Rennes	374	Juigne sur Saone	254
Montfort	396	Sable	259
Guingamp	506	Angers	308
Morlaix	564		
Brest	624		
Paris to Granville:			
Versailles	17		
Dreux	32		
Verneuil	118		
Laigle	141		
Argenton	197		
Vire	271		
Granville	328		

OUEST—PRINCIPAL BRANCH LINES.

Paris to Alençon:		Caen to Le Mans:	
Chartres	88	Falaise	52
Conde	141	Argenton	68
Mortagne	171	Alençon	111
Alençon	208	Le Mans	167
Lison to Lamballe:		Caen to Laval:	
St. Lo	19	Comfront	89
Coutances	48	Mayenne	126
Aoranches	94	Laval	157
Dol	138		
Dinan	166		
Lamballe	207		

ORLEANS—MAIN LINES.

Paris to Bordeaux:		Paris to Montauban:	
Etampes	56	Orleans	121
Orleans	121	Vierzon	200
Blois	178	Chateauroux	273
Tours	234	Limoges	400
Chatellerault	299	Brive	499
Poitiers	332	Gourdon	558
Ruffec	398	Cahoes	599
Angouleme	445	Montauban	662
Libourne	543	Paris to Eygurande Merlines:	
Bordeaux	578	Vierzon	200
Paris to Agen:		Bourges	232
Limoges	400	St. Aurand Mont	277
Perigueux	499	Montluçon	326
Eiorac	563	Eygurande Merlines	419
Mousempron	608	Paris to Le Croisic:	
Agen	651	Tours	234
Paris to Toulouse:		Saumur	295
Limoges	400	Angers	339
Brive	499	Ancenis	394
Tigeac	589	Nantes	427
Villefranche de Rouergue	624	St. Nazaire	491
Gaillac	694	Le Croisic	516
Toulouse	748		

ORLEANS—PRINCIPAL BRANCH LINES.

In kilometers, 1=0.62137 mile.

Termini and principal intermediate stations.	Distances.
	Kilometers.
Sarenay to Landerneaux:	
Redon	42
Vannes	96
Lorient	150
Quimper	215
Chateaulin	245
Landerneau	299
Bordeaux to Le Buisson:	
Libourne	36
Bergerac	97
Le Buisson	134
Bordeaux to Brivé:	
Libourne	36
Coutras	52
Peregueux	127
Brivé	199
Limoges to Clermont Ferrand:	
Meymac	97
Eygurlande Merlines	131
Volvic	197
Clermont Ferrand	217
Bourges to Beaune la Rolande:	
Argent	62
Les Bordes	94
Bellegarde Quieres	121
Beaune la Rolande	135
Poitiers to St. Sulpice:	
Montmorillon	54
St. Sulpice	126
Tours to Montlucon:	
Loches	47
Chateauroux	118
Montlucon	105
Angouleme to Limoges:	
Roumazares	53
Saillat Chassenon	74
Limoges	118

PARIS-LYONS-MEDITERRANEAN—MAIN LINES.

Paris to Marseilles:	
Melun	45
Fontainebleau	59
Sens	113
Joigny	146
Tonnerre	197
Dijon	513
Beaune	352
Chalon sur Saone	383
Macon	440
Trevoax	486
Lyons	512
Vienne	543
Valence	618
Montelimar	662
Avignon	742
Arles	777
Marseilles	863
Marseilles to Vintimille:	
Toulon	67
Nice	225
Vintimille	260
Dijon to Pontarlier:	
Dole	47
Pontarlier	140
Dole to Belfort:	
Besançon	92
Montbeliard	170
Belfort	188
Lyons to Nimes:	
Givors	21
Tournon	93
Nimes	280
Culoz to Modane:	
Chambery	36
St. Jean de Maur	107
Modane	134
Lyons to Geneva:	
Amberien	52
Geneva	168
Lyons to Grenoble:	
La Tour du Pin	57
Grenoble	121
Paris to Lyons:	
Melun	45
Fontainebleau	59
Montargis	118
Gien	155
Cosne	196
Nevers	254
Moulins	313
La Palisse	372
Roanne	421
Lyons	507
Roanne to Lyons:	
St. Etienne	77
Lyons	135
Macon to Geneva:	
Bourg	38
Culoz	119
Bellegarde	152
Geneva	186
St. Germain des Fosses to Nimes:	
Gannat	24
Clermont Ferrand	65
Issoire	100
Brioude	135
Aleis	320
Nimes	369
Tarascon to Cette:	
Nimes	28
Montpellier	77
Cette	105

PARIS-LYONS-MEDITERRANEAN—PRINCIPAL BRANCH LINES.

In kilometers, 1 = 0.62137 mile.

Termini and principal intermediate stations.	Distances.	Termini and principal intermediate stations.	Distances.
	Kilometers.		*Kilometers.*
Dijon to St. Amour:		Grenoble to Marseilles:	
Louhans	88	Sisteron	159
St. Amour	113	Aix	276
Lyons to Bellegarde:		Marseilles	305
Bourg	59	Laroche to Nevers:	
Bellegarde	123	Auxerre	19
Amberieu to Vesoal:		Clamecy	72
Bourg	83	Nevers	147
Lous le Saunier	147	Nevers to Chagny:	
Poligny	176	Etang	105
Bessançon	237	Chagny	163
Vesoul	301	Cravant to Autun:	
Valence to Chambery:		Avalon	38
Grenoble	99	Autun	125
Chambery	161	Clermont to St. Etienne:	
Livron to Briançon:		Thiers	39
Die	54	Montbrison	104
Veynes	117	St. Etienne	137
Gap	143		
Embrun	181		
Briançon	225		

MIDI—MAIN LINES.

Bordeaux to Cette:		Montauban to Montpellier:	
Marmande	79	Lasaur	59
Agen	136	Castres	99
Montauban	206	St. Pons	153
Toulouse	257	Paulhan	229
Castelnaudary	312	Montpellier	259
Carcassonne	348	Toulouse to Bayonne:	
Narbonne	407	Muret	21
Beziers	432	St. Gaudens	91
Cette	476	Tarbes	157
Narbonne to Port Bon:		Pau	216
Perpignan	64	Orthez	256
Elne	78	Bayonne	322
Port Bon	107	Bordeaux to Hendaye:	
Beziers to Neusargues:		Dax	148
Bedarieux	43	Bayonne	198
Tournessière	93	Hendaye	233
Millau	118	Morceux to Tarbes:	
Marvejols	189	Mont de Marsan	148
St. Flour	258	Tarbes	246
Neusargues	277		

MIDI—PRINCIPAL BRANCH LINES.

Castelnaudary to Carmaux:		Agen to Riscle:	
Castres	55	Nerac	39
Albi	104	Condom	60
Carmaux	119	Eauze	94
Toulouse to Ax les Thermes:		Riscle	116
Foix	83	Agen to Tarbes:	
Ax les Thermes	124	Auch	70
Mont de Marsan to Marmande:		Vic Bigorre	135
Casteljaloux	73	Tarbes	148
Marmande	98		

ÉTAT—MAIN LINES.

Paris to Bordeaux:		Nantes to Bordeaux:	
Chartres	88	La Roche sur Yon	77
Saumur	286	La Rochelle	180
Niort	415	Rochefort	209
Saintes	492	Saintes	253
Bordeaux	618	Bordeaux	379
Tours to Les Sables d'Olonne:			
Chinon	50		
Thouars	98		
Les Sables d'Olonne	251		

ÉTAT—PRINCIPAL BRANCH LINES.

In kilometers, 1 = 0.62137 mile.

Termini and principal intermediate stations.	Distances.	Termini and principal intermediate stations.	Distances.
	Kilometers.		*Kilometers.*
Nogent le Rotrou to Orleans:		Pons to La Greve:	
Chateaudun	63	Saujon	38
Passy	92	Royan	47
Orleans	116	La Greve	61
Angers to Poitiers:		Nantes to Poitiers:	
Loudun	87	Clisson	27
Poitiers	157	Cholet	66
Poitiers to La Rochelle:		Bressuire	113
Niort	78	Parthenay	147
Rochefort	142	Poitiers	203
La Rochelle	145		

TRAIN ACCOMMODATIONS AND CHARGES.

On all the foregoing trunk lines, through passenger trains are run daily. These include the express or fast trains, stopping only at important points, and the "omnibus" or accommodation trains, which stop at every station.

The railway cars or voitures (carriages) are divided into several (usually five) compartments, of the first, second, and third classes.

Some of the fast through trains carry only first and second class passengers; others, as well as all of the omnibus trains, carry all classes of passengers. In each class separate compartments for women, and also for smokers, are required to be provided. Sleeping and dressing room compartments and dining cars are also attached to the through trains on all the principal lines. For these accommodations special charges are made, in addition to the first-class fares.

The passenger and freight rates are regulated by the Government. No change of any kind can be made in either without the approval of the minister of public works. The freight and passenger tariffs are revised from time to time, but important changes are infrequent. The passenger rates now in force are as follows:

First class, 0.112 franc per kilometer (3½ cents per mile); second class, 0.0756 franc per kilometer (2½ cents per mile); third class, 0.0493 franc per kilometer (1½ cents per mile). These are the rates for single tickets. Return, or round-trip tickets, good for one to eight days, are sold on all lines at a discount from the above rates of 20 to 40 per cent.

For fête days or holidays and on special occasions, for great celebrations or demonstrations of any kind, large reductions are made for tickets, good from one to eight days, and usually only for certain trains. Soldiers and sailors are carried at one-fourth of the regular fares; children under 7 years of age at half fares. Weekly, monthly, and quarterly commutation tickets are sold between the large cities and suburbs and adjacent towns at reductions of about 50 per cent from the regular tariff. Workingmen's and students' commutation tickets, for use in going daily to and from places of employment and educational institutions, are sold at a discount averaging 50 per cent. No ticket

is sold for any distance for less than 30 centimes (about six cents). Thirty, sixty, and ninety day excursion tickets are sold for the different winter and summer resorts in France and adjacent countries from all points in France, good on all trains, at liberal reductions from the schedules. Circular tickets, good for a certain specified period, and embracing all the points on certain lines or within a certain radius, are sold also on very favorable terms.

Persons who wish to visit in succession a number of points in France, or in the neighboring countries, can, by giving a reasonable notice in advance, secure tickets covering the desired itinerary at the same discounts offered by the different companies for the itineraries arranged by themselves.

By the payment of 260 francs ($67.50), a certificate can be secured entitling the purchaser for the period of one year to transportation between any two points in France at one-half the schedule rates. Sixty pounds of baggage is carried free for passengers of every class. All baggage in excess of this amount is charged for at the rates for merchandise forwarded by express. A charge of 10 centimes (about 2 cents) is made for registering (or checking) each piece of baggage.

EXPRESS AND FREIGHT RATES.

Ordinary merchandise is carried by express (on passenger trains) at the rate of 0.35 franc (about 7 cents) per ton per kilometer (0.62137 mile), with a reduction of 33 per cent on packages not weighing over 40 kilograms (88.18 pounds). Packages exceeding 1,000 kilograms (1 ton of 2,204.6 pounds) in weight are not carried by express. The charges for dogs, by express, are 0.168 franc per kilometer (5$\frac{1}{5}$ cents per mile; horses, 0.16 franc per kilometer (5 cents per mile).

Freight rates are as follows: Under 40 kilograms (88.18 pounds), 0.25 franc per ton per kilometer (7.7 cents per mile); between 40 and 3,000 kilograms, 0.40 franc per ton per kilometer (12$\frac{1}{2}$ cents per mile), and between 3,000 and 20,000 kilograms the rates are doubled.

The following articles are carried at a uniform rate of 0.06 franc per ton per kilometer (1.8 cents per mile): Firewood for domestic use, coke, coal, empty barrels, laths, lime, plants, sea salt, and timber. This special tariff is subject to occasional variation. The present rates for live stock are as follows: Cows, horses, mules, donkeys, 0.10 franc per kilometer (3.1 cents per mile); calves and pigs, 0.04 franc per kilometer (1.2 cents per mile); sheep and goats, 0.02 franc per kilometer (0.6 cent per mile). The rates for carriages are: Two-wheeled, 0.25 franc per kilometer (7.7 cents per mile); four-wheeled, 0.32 franc per kilometer (9.9 cents per mile).

CONDITION OF LINES.

On the 31st of December, 1894, the total length of railway lines in actual operation in France was 40,199 kilometers (24,978 miles). These lines are, as a general rule, substantially constructed and kept in very

good condition, although the average, both as regards construction and maintenance, is distinctly inferior to that of the railways in the United Kingdom. It is officially stated by the direction des chemins de fer (director of railways), that of the 40,000 kilometers of railway lines in actual operation, all but 2,000 kilometers is in good condition, i. e., not in need of material repairs. As regards rolling stock and general equipment, the railroads of France are deficient, compared with those of the United States and the United Kingdom. However, a distinct improvement has been made in these respects during the last few years. In the passenger service, some of the comforts and luxuries with which the traveling public of the United States has long been familiar, have been introduced, and more are promised. The express trains, on the chief lines, are run at very good speed. All through night passenger trains carry sleeping cars, and the corresponding day trains include dining cars and drawing-room cars. The compartment system is, however, maintained on all lines.

RAILWAY ACCIDENTS.

Accidents are comparatively infrequent, and the proportion of trainmen and passengers injured in transit is considerably less than in the United States. The Government supervision is very rigid, and the officials of the railroads are held to a sharp responsibility, not only for accidents, but for delays and other deficiencies in the train service. Every accident involving loss of life, or having other serious results, is promptly investigated, and if negligence or incompetency is proved to have been the cause, the persons derelict, including not only subordinates, but superintending officials, are summarily dealt with.

ENGINEERING DIFFICULTIES.

No extraordinary obstacles have been encountered in the construction of the railways of France, the topography of the country being generally favorable. In the mountain districts, a great deal of tunneling was necessary, and there are many bridges, culverts, etc., on the principal railways which were costly and are admirable pieces of work. But the railway system of France embraces no monuments of engineering skill and genius sufficiently notable to call for special mention here.

RIVER AND CANAL SERVICE.

The interior navigation of France, by rivers and canals, is very much developed. The freight traffic on the large rivers and the chief canals is very heavy, and during the summer a considerable number of passengers, chiefly tourists, are carried on the river steamboats.

The principal companies and firms engaged in operating regular lines on the rivers or canals are: La Compagnie Générale de Navigation, (Havre-Paris-Lyons—Marseilles); La Compagnie Française des Trans-

ports Fluviaux et Maritimes; La Compagnie de Navigation sur les Canaux du Centre; La Maison Frétigny; and La Maison Pavot Frères.

In addition to the regular lines, canal and river tonnage is always available in ample supply.

The tonnage of the canal lighters varies from 50 to 320 tons dead weight. A lighter can travel from Calais, via the canal system, through to Marseilles, if needed, and, in fact, the French Government torpedo boats have performed the journey several times. The number of kilometers of canals in operation January 1, 1895, was 4,805, and the length of navigable rivers at the same date was officially reported at 7,591 kilometers, making the total length of navigable canals and rivers 12,396 kilometers (7,703 miles).

The tonnage of shipments over these canals and rivers during the first eleven months of 1894 and the corresponding period of 1893 was as follows:

Description.	1894.	1893.
Canals	14,558,081	13,630,708
Rivers	10,380,099	9,485,738
Total	24,938,189	23,116,446

Increase of tonnage in 1894, 1,821,734.

The canals whose traffic is the most important are the following: St. Quentin (Cambrai to Chauny); Haute Deûle (Fort de Scarpe to Marquette and the branch to Seclin); Oise and Manicamp (Janville to Chauny); Aire (Bauvin to Aire and the branch to Noeux); Sensée (Etrun to Courchelettes); Marne à la Saône (Vitre le Francois to the German frontier); Latéral à l'Aisne (Vicax les Asfeld to Celles); Neufossé (Aire to St. Omer); St. Denis (Paris to the Briche); Aisne à la Marne (Berry au Bac to Conde sur Marne); Latéral à la Marne (Couvrot to the lock of Dizy); Southeast Branch (Belgian frontier to Troussey); Southeast Branch (Toul to Corre and the branch to Nancy); Oise à l'Aisne (Abbecourt to Bourg et Comin); Latéral à la Loire (Digoin to Briare and branches); Centre (Chalon sur Saone to the Loire); Bourbourg (Guindal to Dunkirk).

The most important navigable rivers are the Seine (Montereau, through Paris and Rouen to Havre), on which an aggregate tonnage of 18,279,702 was carried during the first eleven months of 1894; the Escaut (Cambrai to the Belgian frontier); the Oise (Janviile to the Seine); the Scarpe (Arras to Mortagne); the Aa (St. Omer to Gravelines); the Garonne (Agen to the confluence of the Dordogne); the Saone (Corre to the confluence of the Rhone at Lyons); and the Rhone (Parc, through Lyons and Arles, to the Mediterranean).

The following are the companies operating the principal navigable river and canal lines in France: La Compagnie Française de Transports Fluviaux et Maritimes, which has recently absorbed the river

fleets of the Compagnie Messageries Nationales, and the Compagnie de Transports Rapides. The combined fleets number 144 boats, ranging from 150 to 1,000 tons each, with a total tonnage of 39,500 (45 steamboats, with a tonnage of 7,000, and 99 barges, with a tonnage of 32,500). This company operates on the River Seine, serving Havre, Rouen, Paris, Corbeil, Montereau, etc. Its annual traffic will reach 540,000 tons, consisting largely of grain, flour, oil, cotton, metals, lumber, etc.

There is a daily service between Paris, Rouen, Harfleur, and Havre; a triweekly through service between Paris and Havre (time of passage, four days); a daily service between Rouen and Elbeuf, and other regular and special services. These boats carry a vast quantity of heavy merchandise from Paris, Rouen, and other points for transshipment by ocean steamers from Havre. Freight rates per 100 kilograms (220.46 pounds) from Paris to Havre, and vice versa, are from 7 to 16 francs ($1.35 to $3.09), according to quantity; from Paris to Rouen, and vice versa, 5 to 12 francs ($0.965 to $2.32).

The Société Générale Anonyme de Navigation sur les Canaux du Centre operates lines between Paris, Roanne, and Lyons on the Bourgogne and the Bourbonnais. Its fleet consists of 220 boats, 30 by 5 meters (16.4 by 98.4 feet), with a total capacity of 48,896 tons. The traction on the canals is by animal power. There is no regular schedule of arrivals and departures, which are made to suit the demands of shippers. The distance between Roanne and Paris, 442 kilometers (275 miles), is covered in twenty-five days. The freight rates average 0.013 franc ($0.0025) per ton (2,204.6 pounds) per kilometer.

The Compagnie Générale de Navigation carries an extensive traffic on the Seine, the Rhone, the Oise, the Aisne, the Saone and on many canals. The fleet of the company at present consists of 29 steam tugs, 39 steam carriers, and 505 barges. The largest barges have a tonnage of 800. The largest steamers serving on the Rhone have a tonnage of 600, and from 300 to 500 horsepower. A majority of the boats made for passing through the locks of the canals measure 30 by 5 meters (16.4 by 98.4 feet) and have a capacity of 200 to 280 tons.

The services are: Daily from Paris to Rouen and Havre; weekly by steam carriers from Havre and from Rouen to Rheims, touching at all the ports of the Oise and the Aisne; semiweekly departures by steamers from Paris to Rheims, touching at all the ports of the Oise and the Aisne; express service from Paris to Lyons, touching at all the localities of the Haute Seine, of the Yonne, of the Canal of Bourgogne, of the Doubs, and of the Saone: Montereau, Sens, Joigny, Troyes, Auxerre, Clamecy, Laroche, Tounerre, Montbard, Dijon, St. Jean de Losne, Gray, Dôle, Besançon, Chalon sur Saone, Macon, Villefranche sur Saone, Chalons sur Marne, St. Dizier; service of the "Centre," serving the canals of the Loing, Orléans, Briare, Latéral of the Loire, Berry, Centre-Montarges, Briare, Orléans, La Charité, Nevers, Decize, Roanne, Le Creusot; special services by steamers on the Rhone and the canals of

the Midi, from Lyons to Vienne, Valence, Avignon, Beaucaire, Arles, St. Louis du Rhone, Cette, Marseilles; passenger and freight service from Lyons, four departures per week, stopping at Givors, Vienne, Condrieu, Serriers, Audance, St. Vallier, Tournon, Valence, Le Teil, Bourg-St. Andeol, Pont St. Esprit, Avignon.

HIGHWAYS.

Reference has already been made to the magnificent system of public highways, extending to every section of the Republic, which is not surpassed in any country in the world. These great arteries of communication form an invaluable adjunct to the railway, river, and canal systems of France, and give practically every inhabitant of the country easy access to the markets. These highways have been made the subject of comprehensive and valuable reports by several United States consuls in France.[1]

It has been estimated that the cost of wagon transportation on the highways of France does not average more than one-third the corresponding expense in the United States. In the rural districts it is customary to haul 3 tons, and in the cities from 3 to 5 tons, net freight with one horse. The highway system of France has been practically completed for many years, and it is only necessary to maintain it at its present standard, which is assured by a most efficient organization working under laws and regulations fortified by generations of rigid observance. The improved macadamized highways of France had a total length of 323,400 kilometers (200,951 miles) as long ago as 1867, while the length of unfinished highways was then stated at 281,100 kilometers (174,667 miles), most of which are now considered finished. What is regarded as an unfinished or unimproved highway in France, however, would be pronounced in many parts of the United States, and in nearly all countries, in fact, almost an ideal road.

The great national highways of France vary in width from 8 to 10 meters (26 feet 3 inches to 32 feet 10 inches); the departmental roads, from 6 to 8 meters (19 feet 8 inches to 26 feet 3 inches); and the communal roads, from 3 to 6 meters (9 feet 10 inches to 19 feet 8 inches). These widths do not include the ditches at the sides of the roads. From every important railway town regular lines of diligences, or mail coaches, run to neighboring villages, and the facilities for transportation of freight and passengers to points off the railroad lines are of the best.

ACKNOWLEDGMENTS.

For information embraced in this report, I am indebted to Messrs. Reymond, Schelle, and Abbecourt, leading officials of the ministry of public works. I also desire to acknowledge the valuable cooperation of Consuls Thomas, of Marseilles; Wiley, of Bordeaux; Chancellor, of

[1] See Special Consular Reports "Streets and Highways."

Havre; Shepard, of Calais; Savage, of Nantes, and Angell, of Roubaix, and of Consular Agents Moleux, of Boulogne sur Mer; Morel, of Dunkirk, and Pitel, of Brest.

SAMUEL E. MORSS,
Consul-General.

PARIS, *March 15, 1895.*

SPAIN.

PORT OF BARCELONA.

The port of Barcelona is shaped like a funnel. Its greatest length is from north to south, about 1 mile. Its greatest width is 3,608 feet. The depth of the water varies from 12 to 45 feet. The number and tonnage of vessels that entered in 1890, 1891, and 1892 were:

Year.	Number.	Tons.
1890	3,467	2,137,466
1891	3,477	1,902,936
1892	3,574	2,285,611

The nationality of the vessels entered in 1892 was as follows:

Nationality.	Number.	Nationality.	Number.
Spanish	2,610	English	342
German	40	Italian	248
Belgian	1	American	11
Danish	19	Russian	19
French	118	Norwegian	103
Greek	30	Turkish	1
Dutch	11	Austrian	19

Of these vessels, forty-eight were men of war.

OCEAN LINES.

La Compañía Transatlántica.—The most important line of steamers connecting this port with the rest of the world is La Compañía Transátlantica, which is composed of private individuals. It has a fleet of thirty steamers, all of which carry the mails between the various ports which they connect. The lines of this company are six in number. Antilles and Mexico Line, Philippine Line, Buenos Ayres Line, Fernando Po Line, Morocco Line, and Tangier Line.

(1) *Antilles and Mexico Line.*—The steamships assigned to the Antilles-Mexican Line are the following:

Name.	Registered tons.	Horse-power.	Name.	Registered tons.	Horse-power.
Montevideo	5,500	5,000	Alfonso XIII	5,200	6,000
Buenos Aires	5,500	4,800	Ciudad de Santander	3,700	4,200
Alfonso XII	5,500	5,000	Cataluña	3,700	4,200
Reina Maria Cristina	5,200	6,000	Antonio Lopez	3,700	4,000

Three trips are made to and from the Antilles, Progreso, and Vera Cruz every month by the steamers of this line. The first steamer leaves Barcelona on the 5th of each month, and proceeds to Malaga, Cadiz, Puerto Rico, Havana, Progreso, and Vera Cruz; the second steamer leaves Liverpool on the 11th of every month, and proceeds to Havre, Santander, Corunna, Puerto Rico, Havana, Progreso, and Vera Cruz; the third leaves Barcelona the 25th of every month, and proceeds to Malaga, Cadiz, Las Palmas, Puerto Rico, Havana, Progreso, and Vera Cruz. On their return trips, they leave Havana on the 10th, 20th, and 30th of every month. The steamer that leaves Havana on the 10th touches at Puerto Rico, and then proceeds to Cadiz; the steamer that leaves on the 20th goes directly to Cadiz, while the steamer that leaves on the 30th proceeds directly to Corunna and Santander. During the quarantine season (from May 10 to September 30), all these steamers proceed from Havana direct to Corunna or Santander.

In combination with this line there is a line of steamers between Havana and New York. From both ports the dates of departure are the 10th, 20th, and 30th. Other combinations are made with the Pacific Mail Steamship Company for the ports on the Pacific, from Panama to San Francisco, and with the Pacific Steam Navigation Company and the Sud-Americana de Vapores from Panama to Valparaiso.

The steamers of this company that ply between Havana and the Atlantic ports are the following: *Mejico* (2,112 tons), between Havana and Santiago de Cuba; *Ciudal Condal* (2,595 tons), between Vera Cruz and Havana; *Habana* (2,678 tons), between New York and Havana; *Panama* (2,085 tons), between New York and Havana; *M. L. Villaverde* (1,501 tons), between Havana and Santiago de Cuba.

The following steamers are put on this or on any of the other lines whenever the necessity arises:

Name.	Tons.	Horse-power.
España	2,700	1,600
San Francisco	2,700	1,800
San Augustin	2,400	1,700

The distances between the several places are:

From—	Miles.	From—	Miles.
Santander to Corunna	225	Puerto Rico to Santander	3,482
Corunna to Puerto Rico	3,305	Corunna to Santander	225
Puerto Rico to Havana	975	Havana to Progreso	444
Cadiz to Las Palmas	685	Havana to Vera Cruz	881
Las Palmas to Puerto Rico	2,849	Havana to New York	1,191
Cadiz to Puerto Rico	3,363	Havana to Santiago de Cuba	595
Havana to Puerto Rico	975	Havana to New Orleans	580
Havana to Cadiz	4,053	Havana to Savannah	613
Havana to Corunna	3,868	Havana to Charleston	643
Havana to Santander	4,066	Havana to Norfolk	961
Puerto Rico to Cadiz	3,345	Barcelona to Cadiz	596

The freight tariffs on the Antilles and Mexican Line are as follows, per cubic meter or 1,000 kilometers (2,240.6 pounds):

To—	First class.	Second class.	Third class.	To—	First class.	Second class.	Third class.
	a Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Puerto Rico	100	.....	.....	Puerto Cabello	100	75	50
Havana	100	75	50	Cartagena	100	75	50
Vera Cruz	100	75	50	Colon	100	75	50
La Guayra	100	75	50	New York	142	108	81

a A peseta is equal to 19.3 cents, but at the present time the value is much less on account of the high rate of exchange between Spain and the United States, which varies from 20 to 23 per cent.

The classification of merchandise is as follows:

First class.—Fans, cashmere, hair, ivory, shells, ribbons, laces, gloves, millinery goods, works of art, church ornaments, silk handkerchiefs, velvets, and similar articles.

Second class.—Arms, traveling articles, wax, chocolate and confectionery, cutlery, leather, boots and shoes, brushes, carriages, drugs, mirrors, artificial flowers, toys, books, linen and linen goods, haberdashery, furniture, willowware, cards, wool, woolen goods, paper and pasteboard boxes, writing paper, umbrellas, perfumery, pianos, chemical products, animal hair, porcelain, hardware, hats, seeds, belting, cotton goods, clothing, musical instruments, metal goods, watchmakers' goods.

Third class.—Oil, mineral water, olives, garlic, copper, nuts, starch, hemp sandals, rice, sugar, codfish, bitumen, bottles, candles, lime, cement, common shoes, hemp, onions, preserves, tie brooms, empty demijohns, iron nails, dried fruits, gum, biscuits, grain, flour, soap, hay, earthenware, liquids in casks or bottles, marble, machinery, iron and kitchen furniture, mill and grind stones, printing paper, maccaroni and alimentary pastes, provisions, empty bags, grease, corks, ink, packing cloth, domestic utensils, common glassware, wine, and agricultural implements.

By special arrangements made with North and South American transportation companies, goods may be sent from Spain to the various Atlantic and Pacific ports at the following rates per cubic meter or 1,000 kilograms (2,204.6 pounds):

To—	First class.	Second class.	Third class.	To—	First class.	Second class.	Third class.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
New Orleans	148	117	86	Punta Arenas, San Juan del Sur, Corinto, Champerico	165	120	100
Savannah	155	125	114				
Charleston	164	145	121				
Georgetown	157	136	116				
Baltimore	154	130	100	San Benito, Acapulco, San Blas, San Lucas	165	145	125
Philadelphia	147	118	97				
San Francisco	165	95	95				
Boston	147	123	93	Buenaventura, Manta	240	150	140
Quebec	168	151	123	Callao	200	82	75
Panama	160	150	100	Valparaiso	240	175	160

The return voyage freight charges per cubic meter or 1,000 kilograms (2,204.6 pounds) are:

From—	First group.	Second group.	Third group.
	Pesetas.	*Pesetas.*	*Pesetas.*
Havana and Puerto Rico	90	45	35
La Guayra and Colon	185	160	105

The three groups above mentioned comprise: First, brandy and tobacco; second, sugar, leather, and metals; third, inferior sugar, cocoa, and coffee.

In all cases the company reserves to itself the right to charge either according to the cubic meter or the 1,000 kilograms, and passenger tickets bought outside of Spain must be paid for in francs[1] or their equivalent.

The passenger rates on the Antilles and Mexico Line are:

Barcelona to—	First class.	Second class.	Third class.	Steerage.
	Pesetas.	*Pesetas.*	*Pesetas.*	*Pesetas.*
San Juan de Puerto Rico	850	500	450	175
Havana	900	600	450	175
Santiago de Cuba	900	600	450	175
Progreso	1,000	700	450	225
Vera Cruz	1,000	700	450	225
Colon, Puerto Limon, La Guayra	1,000	650	450	225
New York	1,150	735	535	485

(2.) *The Philippine Line.*—Thirteen round trips per annum are made to the Philippine Islands. The steamers employed on this line are the following:

Name.	Tons.	Name.	Tons.
Isla de Luzón	4,256	Montevideo	5,296
Isla de Mindanao	4,124	Santo Domingo	2,805
Isla de Panay	3,544	San Francisco	2,526
San Ignacio de Loyola	3,227		

According to the schedule for 1893–94, the first steamer left Liverpool December 20, 1893, and the others were to follow exactly four weeks apart, touching at Corunna, Vigo, Lisbon, Cadiz, Cartagena, Valencia, and Barcelona, and proceeding from Barcelona to Manila, touching en route at Port Said, Suez, Aden, Colombo, and Singapore. On their return, they touch at all the ports mentioned, and also at Santander, the only exception being Colombo, which they avoid during the southwest monsoon, from April until October.

On this line, as on all the other lines of this company, passenger tickets, if bought in Spain, are paid for in pesetas, but if bought in other

[1]The franc, lira, and peseta mentioned throughout this report are each valued at 19.3 cents by the United States Treasury Department.

countries they must be paid for in francs or their equivalent. Tickets purchased in Spain, therefore, are cheaper, owing to the exchange. Return tickets, good for nine months, may be had at a reduction of 28 per cent, and for a year at a reduction of 17 per cent. The price of tickets is as follows:

Barcelona to—	First class.	Second class.	Third class.	Steerage.
	Pesetas.	*Pesetas.*	*Pesetas.*	*Pesetas.*
Port Said	400	320	160	.....
Suez	450	360	180	.....
Aden	875	700	350	.....
Colombo	1,000	700	300	.....
Singapore	1,375	1,000	690	.....
Manila	1,780	1,460	660	455
Valencia	35	25	20	15
Cartagena	60	50	30	20
Malaga	90	75	50	30
Cadiz	110	90	60	45
Vigo	160	115	80	55
Corunna	185	130	95	72
Santander	210	155	105	82
Havre	240	185	125	100
Liverpool	300	240	145	110

The freight charges on the Philippine Line, per cubic meter or 1,000 kilograms (2,204.6 pounds) are:

Barcelona to—	First group.	Second group.	Third group.	Fourth group.
	Pesetas.	*Pesetas.*	*Pesetas.*	*Pesetas.*
Port Said	20	10	.....	.....
Suez	35	12	.....	.....
Aden	60	40	27.67	.....
Colombo	75	50	34.72	.....
Singapore	80	60	41.66	.....
Manila	100	70	50 to 60	45 to 50

The freight charges to ports connected with the ports at which this line of steamers touch are:

To—	First group.	Second group.	Third group.	To—	First group.	Second group.	Third group.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Bombay	59.57	55.17	46.34	Batavia	80	60	48.61
Kurrachee	66.34	64	55.17	Saigon	80	60	41.66
Bushire	76.12	71.71	62.89	Hongkong	80	60	48.61
Mozambique	125	100	69.44	Shanghai	100	70	48.61
Zanzibar	125	100	69.44	Hiogo	100	70	55.55
Sydney	80	60	48.61	Yokohama	100	70	55.55
Calcutta	80	60	41.66				

The articles comprised in the various groups are:

First.—Fans, mineral water, chocolate, confectionery, fruits, images, hams, printed books, metals, cards, pepper, chemical and pharmaceutical products, jewelry, clothing, vinegar, and cheese.

Second.—Oil, almonds, brandy, rice, codfish, salt meat, preserves, cork, beans, flour, tin, butter, marble, furniture, sardines, and wine.

Third.—Rubber, candles, shoes, musical instruments, soap, liquors, carriage and railway materials, organs, perfumery, pianos, lead, provisions, hats, silk, wool, cotton, and lace goods.

Fourth.—Cement, beer, drugs, iron, porcelain, wood, machinery, paper, pictures, and glass.

The return freight charges are: First group, 100 pesetas; second group, 85 pesetas; third group, 75 pesetas; fourth group, 60 pesetas.

The first group includes coffee, silk, porcelain, tobacco, and tea; the second group, sugar; the third group, cocoa oil, cotton, wood, hats, and cigarette paper; the fourth group, sugar and cocoa.

The distances covered by the steamships of the Philippine Line are:

From and to—	Miles.	From and to—	Miles.
Liverpool to Corunna	694	Cartagena to Valencia	155
Corunna to Santander	225	Valencia to Barcelona	162
Santander to Liverpool	683	Barcelona to Port Said	1,630
Corunna to Vigo	120	Port Said to Suez	87
Vigo to Lisbon	239	Suez to Aden	1,308
Lisbon to Cadiz	240	Aden to Colombo	2,094
Vigo to Cadiz	464	Colombo to Singapore	1,571
Cadiz to Cartagena	311	Singapore to Manila	1,343

(3) *Buenos Ayres Line.*—A steamer of the Buenos Ayres Line leaves Marseilles on the 7th of January, and every two months thereafter during the year 1894, touching at Barcelona, Malaga, Cadiz, Santa Cruz de Teneriffe, and Montevideo. The following are the vessels comprising this line:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Ciudad de Cadiz	3,200	3,000	Ciudad de Santander	3,700	4,200
Antonio Lopez	3,700	4,000	Cataluña	3,700	4,200

The passenger rates on the Buenos Ayres Line are: First class, 800 to 1,000 francs; second class, 500 francs; third class, 200 to 300 francs. There is a reduction of 20 per cent for return tickets, good for a year, and of 25 per cent for a family of four persons.

The freight rates on the Buenos Ayres Line are: From Spain to Montevideo or Buenos Ayres, per cubic meter, 20, 35, 45, and 49 pesetas, according to the class of freight.

The distance from Cadiz to Buenos Ayres is 5,280 miles; from Barcelona to Cadiz, 596 miles.

(4) *Fernando Po Line.*—Of the Fernando Po Line, the steamers *Larache*, of 1,500 tons and 700 horsepower, and the *Fernando Po*, of 127 tons and 130 horsepower, leave Barcelona on the 25th of December, March, June, and September, and leave Fernando Po, on their return, on the 5th of February, May, August, and November.

The passenger rates on the Fernando Po Line are:

Barcelona to—	First class.	Second class.	Third class.	Barcelona to—	First class.	Second class.	Third class.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Cadiz	110	90	45	Setra Eroñ	500	334	166
Las Palmas	300	200	100	Fernando Po	638	426	213
Rio de Oro	280	186	93	Elobey	680	452	228
Dakar	450	300	150	Gaboon	750	500	270
Monrovia	500	334	166				

Return tickets may be bought at a reduction of 20 per cent. General cargo, 50 pesetas per 1,000 kilograms.

The distance from Barcelona to Fernando Po is 3,955 miles.

(5) *Morocco Line.*—The steamers assigned the Morocco Line are the *Mogador*, 500 tons and 350 horsepower; the *Rabat*, 800 tons and 600 horsepower, and the *Larache*, 1,500 tons and 700 horsepower.

The steamers make monthly trips, and the dates of their departure from Barcelona are: *Melilla*, the 20th; *Malaga*, the 21st; *Ceuta*, the 22d; *Cadiz*, the 26th; *Tangier*, the 26th; *Larache*, the 27th; *Rabat*, the 28th; *Casablanca*, the 30th; *Mazagan*, the 30th, and *Saffi*, the 31st.

On the return trips, steamers leave Mogador for Barcelona on the 2d of each month, touching at the same ports touched on the outward trips. The passenger rates on the Morocco Line are as follows, from Barcelona:

To—	First class.	Second class.	Third class.	To—	First class.	Second class.	Third class.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Tangier	85	70	40	Mazagan	110	80	50
Larache	90	70	45	Saffi	70	50	35
Rabat	95	70	45	Mogador	80	60	37
Casablanca	100	75	50				

Return tickets, 10 per cent reduction.

There are no established freight rates, as very little freight is carried by this line.

The distances from Barcelona are:

To—	Miles.	To—	Miles.
Melilla	440	Tangier	544
Mogador	869	Malaga	469
Cadiz	596		

(6) *Tangier Line.*—Only one steamer is assigned to the Tangier Line, viz, the *Joaquin del Pielago*, of 1,000 tons and 1,300 horsepower. This steamer leaves Cadiz Monday, Wednesday, and Friday of each week for Tangier, Algeciras, and Gibraltar, and returns on Tuesday, Thursday, and Saturday.

First-class tickets from Cadiz to Tangier vary from 27 to 55 pesetas; third-class tickets cost 12.50 pesetas; to Gibraltar, first class, from 35 to 75 pesetas; third class, 12.50 pesetas; to Algeciras, first class, from 40 to 75 pesetas; third class, 12.50 pesetas. From Tangier to Gibraltar and Algeciras, first class, from 15 to 40 pesetas; third class, 5 pesetas.

The freight rates are agreed upon by the company and shippers, there being no published tariffs.

The distance from Barcelona to Tangier is 544 miles.

The Pinillos-Saenz Line to Cuba and the United States employs five steamers:

Name.	Tons.	Name.	Tons.
Miguel M. Pinillos	4,000	Pio IX	5,500
Martin Saenz	5,300	Catalina	6,800
Conde Wilfredo	5,000		

They leave Barcelona once a month and touch at Valencia, Malaga, Cadiz, Canary Islands, Puerto Rico (Ponce, Mayaguez), Havana, Matanzas, Cienfuegos, Santiago de Cuba; and on their return voyages stop at New Orleans, Savannah, or New York. The round trip takes about three months.

The passenger rates to all American ports (except Porto Rican ports, which are 25 pesetas less) are: First class, 650 pesetas; second class, 450 pesetas, and third class, 175 pesetas.

The freight charges for all American ports are: Wine, 15 to 17½ pesetas per pipe; merchandise, 30 to 35 pesetas per ton or cubic meter.

From Cadiz to the Canary Islands the Pinillos-Saenz Company carries the Government mails free of charge.

The distances from Barcelona are:

To—	Miles.	To—	Miles.
Valencia	163	Havana	4,497
Malaga	469	New Orleans	5,056
Cadiz	596	Savannah	4,222
Las Palmas	1,212	New York	3,677
Puerto Rico	3,848		

F. Prats & Co. Line.—This company has five steamers, viz:

Name.	Tons.	Name.	Tons.
Juan Forgas	5,000	Berenguer el Grande	5,500
Puerto Rico	4,500	Gran Antilla	5,200
Miguel Galiart	5,500		

The steamers leave Barcelona every twenty days. They do not carry mails.

The passenger rates on the Prats Line from Barcelona are:

To—	First class.	Second class.	Third class.	To—	First class.	Second class.	Third class.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Puerto Rico	625	425	150	Cienfuegos	675	475	200
Ponce and Havana	650	450	175	New Orleans	900	600	300

These steamers go to other ports in the United States if there is cargo. Freight rates are not fixed, owing to competition.

J. Jover y Serra Compañía has two steamers, viz:

Name.	Tons.	Nominal horse-power.	Name.	Tons.	Nominal horse-power.
J. Jover y Serra	3,528	600	Miguel Jover	3,506	600

They do not carry passengers or mails. There are no fixed dates of departure, nor fixed freight rates. They go to Puerto Rico, Cuba, and the United States.

Serra y La Flecha Line.—The steamers of this line, after calling at this port, leave Santander once every week for the principal ports of Cuba. They carry the mails. This line comprises fourteen steamers, viz:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Alicia	4,500	300	Eduardo	3,500	300
Benita	2,500	150	Enrique	4,500	250
Carolina	3,500	300	Federico	3,500	250
Francisca	4,500	300	Guido	5,000	400
Leonora	4,500	300	Hugo	4,500	300
Serra	3,500	300	Pedro	5,000	400
Gracia	5,000	350	Ernesto	5,000	300

Passenger rates on these steamers are conventional for the first and second class passengers, and from 160 to 210 pesetas for third-class passengers. Freight rates are also conventional.

The distance from Santander to Havana is 4,066 miles.

Italian Line.—Steamers of the Società Riunite Florio e Rubattino Navagazione Generale Italiana, which run to Montevideo and Buenos Ayres are the *Sirio*, *Orione*, *Perseo*, and *Regina Margherita* (5,500 tons each). These steamers leave Genoa on the 1st and 15th of every month, call at Barcelona for cargo and passengers, and touch at San Vicente, Cape Verde, for coal. Two days are required for the trip from Genoa to Barcelona, and nineteen days from Barcelona to Montevideo. The distance from Genoa to Barcelona is 357 miles, and from Barcelona to Buenos Ayres 5,870 miles.

The passenger rates are 750, 500, and 175 pesetas for first, second, and third class, respectively. Passengers are booked for Talcahuano, Valparaiso, Caldera, Arios, and Callao, with transfer at Montevideo by steamer of the Pacific Steam Navigation Company.

The freight rates from Barcelona to Montevideo or Buenos Ayres are $22\frac{1}{2}$ pesetas per cask of wine, and 44 pesetas for all other kinds of merchandise per cubic meter.

Knott's Prince Line.—This is an English line and has sixty steamers. On the 9th of every month a steamer leaves Liverpool and touches at Cadiz and Barcelona, and then proceeds to Trinidad, Colon, Progreso, Vera Cruz, and New Orleans. The steamers average from 1,800 to 2,000 tons each, and they do service all over the world. No special steamers are assigned to this line. Another steamer of the line leaves Barcelona

once a month, and proceeds, via Tarragona and Valencia, to Montevideo and Buenos Ayres. When there is sufficient cargo at Barcelona a steamer is detailed to transport it either to New York, the north of France, or the north of England. A steamer of this line leaves Charleston and another leaves New Orleans once a month laden with cotton for Barcelona.

The freight rates are 25 pesetas per ton to all places in Central America and Argentine Republic. Private arrangements may be made regarding cargoes to other parts of the world.

Compagnie Générale Transatlantique.—On the 13th of every month a steamer of this line leaves Marseilles for Barcelona, Malaga, Fort de France, Trinidad, La Guayra, Puerto Cabello, Cartagena, and Colon, where connection may be made with all the Pacific ports. The three steamers at present assigned to this service are the *Ferdinand de Lesseps*, 2,900 tons, 1,700 horsepower; *La Ville de Bordeaux*, 2,800 tons, 1,700 horsepower; *La Ville de Marseille*, 2,900 tons, 1,700 horsepower.

The freight rates are 27, 30, 40, 50, and 100 pesetas, according to the class of merchandise. The rate on a pipe of wine is 25 pesetas.

Passenger rates from Barcelona are 750, 400, and 225 francs for first, second, and third class, respectively.

The Compañía Higonesa.—The names of the steamers of this line are:

Name.	Tons.	Name.	Tons.
Asturias	673	Duro	2,080
Barambio	529	Cifuentes	721
Covadonga	474	Anselmo	783
Julian	445	America	521
Gijon	656		

One of these steamers leaves Barcelona every Wednesday for Tarragona, Valencia, Alicante, Cartagena, Agilas, Malaga, Cadiz, Vigo, Carril, Vilagarcia, Corunna, Ferrol, Ribadeo, Gijon, Santander, and Bilbao.

It takes twenty days to make the trip to Bilbao. No passengers are carried. Freight rates are made by private agreement. Another of these steamers leaves for Alicante, Cartagena, and Agilas on Saturday of each week.

The distances from Barcelona to the several places touched by the steamers of this line are:

To—	Miles.	To—	Miles.
Valencia	163	Vigo	1,039
Alicante	228	Corunna	1,140
Malaga	469	Santander	1,354
Cadiz	596	Bilbao	1,394

Vapores Correos Mallorquines.—This company has five mail steamers plying between Barcelona, Valencia. Alicante, and the Balearic Islands (Palma):

Name.	Tons.	Miles per hour.	Name.	Tons.	Miles per hour.
Belver	1,100	11	Lulio	450	12
Cataluña	1,100	10	Union	570	11
Isleño	600	11			

The passenger rates from Barcelona are 25, 15. and 8 pesetas for first, second, and third class, respectively.

The freight rates are from $7\frac{1}{2}$ to 50 pesetas per cubic meter, according to class of merchandise.

These steamers leave Barcelona on Monday and Thursday. They receive a small subvention from the Government.

The distance from Barcelona to Palma is 130 miles.

Compañía Menorquina.—The steamers of this line leave Barcelona every Wednesday for Port Mahon, and return every Sunday. They make the trip in from twelve to fourteen hours. The names of the steamers and their tonnage are:

Name.	Tons.	Name.	Tons.
Menorquin	545	Comericio	321
Ciudad de Mahon	540	Leon de Oro	278

They touch at Alcudia, where they connect with steamers for Palma. They carry the mails, and receive a subvention from the Government.

The passenger rates range from $7\frac{1}{2}$ to 25 pesetas for first class, from 5 to 15 pesetas for second class, and from 4 to 8 pesetas for third class.

The freight rates are conventional.

Vapores Sloman, jr., of Hamburg.—The steamers of this line are the following:

Name.	Tons.	Name.	Tons.
Barcelona	1,188	Palermo	845
Malaga	1,087	Gergenti	1,494
Marseille	1,380	Capri	888
Genua	1,386	Lissabon	1,005
Livorno	1,087	Licata	1,494
Neapel	1,042	Trapani	1,007

These steamers leave Hamburg three or four times a month for Malaga, Barcelona, Genoa, Leghorn, Naples, Messina, and Palermo. From Hamburg to Barcelona the voyage lasts from ten to twelve days.

The freight rates between Barcelona and Hamburg are 20 pesetas per cubic meter, or 13 pesetas per 1,000 kilograms.

Passengers are carried only from Barcelona to Genoa, the rates being 61 pesetas with meals and 31 without meals.

Compañía Valenciana de Navegacion.—The steamers of this company are the following:

Name.	Tons.	Name.	Tons.
Denia	1,000	Sagunto	900
Grao	1,800	Vicente Sanz	555
Martos	1,800	Cervantes	412
Jativa	1,000		

The last two steamers leave Barcelona, the former on Saturdays and the latter on Wednesdays, for Valencia. The passenger rates are 15, 10, and 7½ pesetas for first, second, and third class, respectively. The other steamers leave Valencia on the afternoons of Tuesday and Saturday. Those that leave on Tuesday proceed to Marseilles, Cette, Barcelona, Valencia, Alicante, Malaga, Almeria, and those that leave on Saturday proceed to Cette, Leghorn, Genoa, Barcelona, and Valencia.

The distances from Barcelona to the several ports are:

To—	Miles.	To—	Miles.
Valencia	163	Marseilles	185
Malaga	469	Cette	148
Alicante	228		

Société Navale de l'Ouest.—The names of the steamers of this line, together with their tonnage, are:

Name.	Tons.	Name.	Tons.
St. André	612	St. Mathieu	553
St. Jean	571	St. Paul	678
St. Luc	474	St. Pierre	571
St. Mare	563		

A steamer of this line leaves Antwerp every ten days, and proceeds to Havre, Lisbon, Alicante, Valencia, Barcelona, Cette, and Marseilles. These steamers do not carry passengers. Freight rates are conventional.

Compañía Sevillana.—This line of steamers does not carry the mails, and is owned, like all the others herein named, by private individuals. The names and tonnage of the steamers are:

Name.	Tons.	Name.	Tons.
Segovia	800	La Giralda	1,800
Luis Cuadra	800	Azualfarache	1,800
Laffitte	800	Sevillano	1,800
San Fernando	800	Ciervana	1,800
Torre del Oro	1,800	Macarcua	1,800

These steamers ply between the following ports: Marseilles, Cette, San Feliu de Guixols, Barcelona, Valencia, Alicante, Cartagena, Almeria, Malaga, Cadiz, Seville, Huelva, Vigo, Carril, Villagarcia, Corunna, Gijon, Santander, and Bilbao.

They leave Barcelona every Friday night for San Feliu de Guixols, Cette, and Marseilles, remaining at each of these ports one day. They leave Marseilles every Wednesday on their return trip, remaining in Barcelona two days and a half, then leaving every Sunday for Valencia and the other ports above named, entering every port at daybreak and leaving after sunset.

The passenger rates are: From Barcelona to San Feliu de Guixols, 12 pesetas; to Cette and to Marseilles, 25; to Valencia, 18; to Alicante, 20; to Cartagena, 25; to Almeria, 30; to Malaga, 36; to Cadiz, 42, and to Seville, 50.

Freight rates per 1,000 kilograms, 10, 15, and 25 pesetas for general merchandise; for flour, in bags, from one-half to 1 peseta per bag.

The distances from Barcelona to the several ports are:

To—	Miles.	To—	Miles.
Cette	148	Huelva	642
Marseilles	185	Vigo	1,039
Valencia	162	Carril	1,060
Alicante	228	Gijon	1,275
Almeria	377	Santander	1,354
Cadiz	596	Bilbao	1,394
Seville	660		

Vapores Espalin & Co.—The names and tonnages of the steamers composing the Vapores Espalin & Co. Line are:

Name.	Tons.	Name.	Tons.
Garcia Vinuesa	2,818	Nuevo Estremaduria	2,800
Andalucia	3,000	Manuel Espalin	2,750
Nuevo Valencia	2,800		

These steamers leave for Cette and Morseilles every Wednesday, and for Valencia, Malaga, Cadiz, and Seville every Sunday. The passenger rates are as follows, meals not included:

To—	First class.	Second class.	Third class.	To—	First class.	Second class.	Third class.
	Pesetas.	*Pesetas.*	*Pesetas.*		*Pesetas.*	*Pesetas.*	*Pesetas.*
Cette and Marseilles	25	20	13	Malaga and Cadiz	50	40	25
Valencia	25	12.50	7.50	Seville	60	45	30

The freight rates to Cette and Marseilles are 15 francs; to Valencia, 12 pesetas, and to Malaga and Cadiz, 25 pesetas per ton.

The distances from Barcelona to the several ports are:

To—	Miles.	To—	Miles.
Cette	148	Malaga	469
Marseilles	185	Cadiz	596
Valencia	162	Seville	660

Ybarra & Co.—The steamers of this line ply between Bilbao, Seville, Barcelona, Marseilles, and the intermediate ports.

Name.	Tons.	Name.	Tons.
Cabo San Vincente	2,300	Cabo San Sebastian	2,300
Cabo San Antonio	2,300	Itálica	1,400
Cabo Quejo	2,300	Cabo Prior	1,200
Cabo Peñas	2,300	Cabo Silleiro	1,200
Cabo Palos	2,300	La Cartuja	1,160
Cabo Trafalgar	2,300	Vizcaya	1,100
Cabo Creux	2,300	Triana	1,000
Cabo Ortegal	2,300	Ibaizabal	1,000
Cabo Roca	2,300	Luchana	550
Cabo Nao	2,300	Cabo Santa Maria	200
Cabo Tortosa	2,300		

The steamers leave Bilbao twice a week, and carry passengers and freight. The passenger rates from Barcelona are as follows:

To—	First class.	Third class.	To—	First class.	Third class.
	Pesetas.	*Pesetas.*		*Pesetas.*	*Pesetas.*
Tarragona	12.50	5	Almeria	30	17.50
Valencia	15	7.50	Corunna	50	25
Alicante	15	7.50	Ferrol	45	25
Cartagena	25	12.50	Santander and Bilbao	45	25
Malaga	40	20	Palanos	15	7.50
Cadiz	50	25	San Feliu de Guixols	15	7.50
Huelva	50	25	Cette	20	10
Vigo and Carril	50	25	Marseilles	25	13

The freight rates from Barcelona to Cette are 10 pesetas per ton, and 4.50 pesetas per cask of wine; to Marseilles, 10 pesetas per ton, and 5.50 pesetas per cask of wine.

The trip to Cette lasts ten hours and to Marseilles eighteen hours.

The distances from Barcelona are:

To—	Miles.	To—	Miles.
Valencia	163	Cadiz	596
Alicante	228	Bilbao	1.394
Tarragona	51	Seville	660
Marseilles	185		

Vapores de Tintoré y Cia.—The steamers of this line are:

Name.	Tons.	Miles per hour.	Name.	Tons.	Miles per hour.
Ter	598	9½	Tintoré	807	10½
Francoli	806	10	Turia	937	11

The steamers run between Spain and England, but not on any fixed days. They leave Liverpool every week for Ferrol, Corunna, Corcubion, Riviera, Muros, Marin, Vigo, Huelva, Cadiz, Malaga, Adra, Almeria, Aguilas, Cartagena, Alicante, Valencia, Burridna, Castellon, Tarragona, and Barcelona. They carry passengers and freight, but the rates are not published.

The distances from Barcelona are:

To—	Miles.	To—	Miles.
Malaga	469	Valencia	162
Cadiz	596	Tarragona	51
Cartagena	285	Corunna	1,140

The distance from Corunna to Liverpool is 694 miles.

Compañía Bandera Española.—The steamers of this line, after taking passengers and freight from Barcelona, leave Santander every fifteen days for Havana:

Name.	Net tons.	Horse-power.	Name.	Net tons.	Horse-power.
Castellano	1,022	200	Madrileño	2,024	250
Catalan	1,022	200	Murciano	1,527	400
Euskaro	1,613	250	Navarro	2,564	350
Gaditana	1,797	400	Palentino	1,562	250
Gallego	1,716	350	Santanderino	2,017	420

Passenger rates to Havana, 500, 250, and 160 pesetas, for first class, second class, and third class, respectively.

The freight rates are conventional.

The distance from Barcelona to Santander is 1,354 miles, and from Santander to Havana, 4,093 miles.

Larrinaga & Co.—The steamers of this line take cargoes of miscellaneous merchandise to Cuba and bring back sugar at conventional rates. They also carry iron ore from Bilbao to England. They have no fixed time for sailing, nor do they carry passengers.

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Alava	1,448	250	Niceto	1,830	275
Buena Ventura	1,155	200	Ramon de Larrinaga	2,010	320
Emiliano	1,427	280	Saturnina	1,826	275

The distances are: From Barcelona to Havana, 4,497 miles; Havana to Santander, 4,066 miles; Santander to Liverpool, 683 miles.

United Steamship Company.—This line has a fleet of 112 steamers, and it takes goods at through rates to the principal ports of Denmark, Russia, Germany, Sweden, Norway, England, Belgium, France, Portugal, Spain, and Greece. Its main office is at Copenhagen. These steamers also carry passengers. The fare from Copenhagen to Barcelona, or vice versa, is $40, first class, and 80 cents a day for meals.

The agent for this line in Barcelona has been recently appointed and is not able to give any particulars about freight rates or tonnage.

The distances from Barcelona to the several ports are as follows, in miles: To Copenhagen, 2,560; to Hamburg, 2,251; to Antwerp, 1,892.

La Veloce: Navigazione Italiana.—This company, which has its head offices at Genoa, has two lines of steamers which touch at Barcelona for passengers and freight. The first line consists of the steamers (1) *Duca di Galliera*, which runs from Barcelona to Las Palmas, Rio Janeiro, Montevideo, and Buenos Ayres; (2) *Vittoria*, to Las Palmas, Montevideo, and Buenos Ayres; (3) *Duchessa di Genova*, to Las Palmas, Montevideo, and Buenos Ayres. They sail from Genoa on the 3d of every month.

The passenger rates are 750 to 1,000 lire, first class, 550 lire, second class, and 173 lire, third class. Return tickets at reduced rates.

The freight rates are 20 to 30 pesetas per pipe of wine, and 40 pesetas per cubic meter.

This line of steamers carries the mails from Genoa, and has eight other steamers which leave Genoa at regular intervals for Las Palmas, St. Vincent, Pernambuco, Bahia, Montevideo, Rio Janeiro, and Santos, and connections may be made with the ports of the Pacific, Rio de la Plata, Uruguay, Paraguay, and the coast of Brazil.

The second line of the La Veloce Company consists of the steamers *Città di Genova* and *Rio Janeiro*. They leave Genoa the 1st of each month, and proceed to Barcelona, Santa Cruz, La Guayra, Puerto Cabello, Curacao, Cartagena, Maracaibo, and Colon, where connections may be made with the Pacific Mail Steamship Company for the ports of the Pacific.

Passenger rates: From Genoa to Barcelona, 50 francs first and second class, and 35 francs third class; Genoa to Santa Cruz, 175 francs first class, and 100 francs third class; Genoa to Colon, 400 francs first class, and 200 francs third class. Return tickets may be obtained at 20 per cent reduction.

The freight rates are 20 to 30 pesetas for a pipe of wine, and 40 pesetas per cubic meter.

The distance from Barcelona to Genoa is 357 miles.

This line carries the mails from Genoa.

Hamburg-American Line.—This line is, indirectly, one of the most valuable lines to Spain. The steamers calling at Gibraltar and Genoa are the following:

Name.	Tons.	Horse-power.	Name.	Tons.	Horse-power.
Werra	4,814	6,300	Spree	6,963	13,000
Fulda	4,814	6,300	Normannia	8,716	16,000
Kaiser Wilhelm	6,991	6,500	Columbia	7,578	13,000

Many American passengers leave these steamers at Gibraltar and travel through Spain, or, after traveling through Spain, meet them at

Gibraltar and proceed on them homeward. Probably within a few years all the great Atlantic passenger lines will detail steamers to convey passengers directly to the great Mediterranean ports, and we may, therefore, expect our trade to increase, and especially with Spain, which refuses to be drawn into "entangling alliances" with the other powers of Europe, and will not be slow to see the advantages that will accrue to her if she can establish close commercial relations with the United States, which is the only other great power that always avoids entangling alliances, and that, consequently, can with the most sincerity offer or reciprocate permanent friendship.

Miscellaneous steamers.—Besides all the steamers heretofore named, there are many coal steamers that come to Barcelona, more or less regularly, from England and Italy, and many "tramp" steamers that bring wheat from Russia, codfish from Norway, and wood, cotton. and petroleum from the United States.

RAILWAYS.

There are three lines of railway connecting Barcelona with other European cities: (1) Tarragona, Barcelona and Frontier of France Railway; (2) Barcelona and Saragossa Railway, and (3) Barcelona, Reus and Saragossa Railway (new line). These three lines are owned by private corporations, but they receive a subvention from the Spanish Government on condition that they carry the mails. They are each single track, broad gauge. The cars of Spanish and French railways can not, therefore, pass into each other's territory.

The first railway in Spain was built in 1848, between Barcelona and Mataro, a distance of 20 miles. From that time until 1890, 9,775 kilometers (6,074 miles) of railway were opened to the public.

Tarragona, Barcelona and Frontier of France Railway.—The route of this railway follows the sea closely and is very picturesque. The distance from Barcelona to Tarragona is 63 miles, and from Barcelona to Port Bon 103 miles. No great natural difficulties have been overcome in the constuction of this line.

Passenger rates from Barcelona to Tarragona are 12.21, 9.51, and 6.11 pesetas, for first class, second class, and third class, respectively.

There are five passenger trains daily to Tarragona, one of which is an express that covers the distance in two hours and thirty-eight minutes. The other four trains cover the distance in from three to four hours To Port Bon, on the frontier, there are two trains daily, and on Monday, Wednesday, and Saturday an additional train for first-class passengers, which leaves Barcelona at 6 p. m. and makes the journey in four hours, while the other trains take from five to six hours. At the French frontier connections are made with trains for Bordeaux, Paris, and Marseilles. A curious fact is that the express trains from Barcelona do not carry the mails, either on this or on the Saragossa line.

The passenger rates from Barcelona to Port Bon are 22.15, 16.77, and 10.71 pesetas, for first class, second class, and third class, respectively.

Barcelona and Saragossa Railway.—There are three express trains every week, one mail, and one mixed train every day, and an average of three freight trains every day from Barcelona to Saragossa, the distance between the two cities being 219 miles. From Saragossa to Madrid the distance is 221 miles, making the entire distance from Barcelona to Madrid 440 miles. Heretofore this has been the shortest line to Madrid, and the time occupied in making the journey on the express train was twenty hours and thirty-six minutes, but on the 1st of July, a new line, hereinafter described, will be opened, and the time will be shortened by about five hours.

Freight rates per 1,000 kilograms per kilometer (0.6214 mile) are: Express (grande vitesse), first class, 65 centavos;[1] second class, 42 centavos; third class, 35 centavos; fourth class, 31½ centavos, and fifth class, 25 centavos. Freight train (petite vitesse), first class, 32 centavos; second class, 21 centavos; third class, 17½ centavos; fourth class, 15¾ centavos, and fifth class, 12½ centavos.

The average passenger rates per kilometer (0.6214 mile) between intermediate points are as follows: Slow trains, 10, 7½, and 4½ centavos for first, second, and third class, respectively, and 12, 8¼, and 4½ centavos on fast trains.

From Barcelona to Saragossa the rates are 42.10, 31.10, and 23.16 pesetas for first, second, and third class, respectively, and from Barcelona to Madrid, 81.90, 62.45, and 42.10 pesetas.

Return tickets can be procured at greatly reduced rates.

At Monistrol, a station on this line, passengers alight who desire to ascend to the Monastery of Montserrat, which is situated about halfway up the mountain of the same name. The distance from Barcelona to Monistrol is 31½ miles, and of the three trains that go there daily, only one succeeds in covering it in two hours. The distance from Monistrol to the monastery is 4½ miles, and the time required to cover it is just one hour. The trains that make this ascent are modeled after those used on the Rigi, and they have proved very satisfactory. The line was opened two years ago. About 80,000 persons visit Montserrat every year, and it is undoubtedly one of the most interesting and delightful of European excursions.

Barcelona, Reus and Saragossa Railway.—This new line to Saragossa was opened on the 1st of July, 1894. It was constructed by the Tarragona, Barcelona and Frontier of France Railway Company and connected two branches of their line already in operation—that from Barcelona to Reus and that from Saragossa to Puebla de Hijar, thus making a through line from Barcelona to Saragossa. The distance from Barcelona to Reus is 106 kilometers (66.7 miles), and from Reus to Saragossa, 235 kilometers (146.4 miles). The number of tunnels on

[1] 100 centavos = 1 peseta; 1 peseta = 19.3 cents.

this line is 76, the total length of which is 22 kilometers (13.6 miles). The longest tunnel is 4,000 meters (13,123 feet), and the shortest is 20 meters (65.4 feet). The bridges number 27, and are between 20 and 300 meters (65.42 to 984 feet) long and 5 to 30 meters (16.4 to 98.4 feet) high. There are also 10 viaducts, of from 100 to 250 meters (328 to 820.2 feet) long and from 20 to 40 meters (65.4 to 131.2 feet) high. There are in all 16 stations on the line. The passenger and freight rates have not yet been announced or arranged. The express trains leave Madrid for Barcelona on Mondays, Wednesdays, and Fridays at 5.30 p. m., and will arrive at Barcelona the following morning at 11.13; returning from Barcelona on Tuesdays, Thursdays, and Saturdays at 6.31, and arriving at Madrid at 11.45 the following morning. There are sleeping and dining cars on these trains.

The distances from Barcelona are: To Tarragona, 63 miles; to Valencia, 234; to Saragossa, 219; to Madrid, 440; to Lisbon, 987; to Gerona, 61; and to Port-Bon, 63 miles.

As there are few competitive lines of railway in Spain, the freight rates are very high—in fact one commonly hears the statement made that it costs more to bring goods to Barcelona from Saragossa than it does from England. Our American exporters, therefore, can not hope to do much trade with the interior of Spain. The high rates for freight and the slowness of the trains account for the lack of development of the interior, and for much of the poverty of the people.

HIGHWAYS.

In Spain, country roads or highways are either national or provincial. The national roads are paid for by the nation and the provincial are constructed under the management of the provincial committees, who spend no fixed sum during any term of years, but such sums as, from time to time, their work requires. The national roads are good, but the provincial roads vary. Those in the wealthier provinces are equal to the national roads, while those in the poorer provinces are not infrequently execrable. The material used is principally small, hard stone, sometimes granite, sometimes limestone, and sometimes sandstone, and the system of construction is always that conceived by Macadam. The cost of construction depends on the kind of stone used and on the distance it is drawn, but it never rises above 32 cents nor falls below 21 cents per square meter (10.7642 square feet) for an average thickness of 20 centimeters (16 inches). As the Province of Barcelona is the wealthiest in Spain, its roads are among the best, but there is still room for improvement. They do not yet compare favorably with the roads of France, Switzerland, Germany, or England.

The most important highway that traverses the Province of Barcelona is that from Madrid to France, by way of La Junquera. This was built in the early part of the century and varies in width between 10 and 20 meters (32.7 and 66.6 feet). Its total length, from Madrid to

Barcelona, is 626 kilometers (389 miles), 93.187 kilometers (57.9 miles) being in the Province of Barcelona. This is a highway of the first class.

The highway from Tarragona to Barcelona, 40.737 kilometers (25.4 miles) in length, in the Province of Barcelona; that from Manresa to Gerona, of which 47.108 kilometers (29.8 miles) are already constructed in the Province of Barcelona, and 31.57 kilometers (19.6 miles) remain to be constructed; and that from Barcelona to Ribas, of which 95 kilometers (59 miles) are in the Province of Barcelona, belong to the second class. Their width varies from 8 to 16 meters (26.2 to 63 feet).

There are many roads of the third class, but they are unimportant, except locally.

As freight rates are so high in Spain people who move their household goods not infrequently convey them even to such distant points as Madrid and Paris in large furniture vans.

As a rule, the highways in this province are lined with plane trees of tender years and are only occasionally favored with rain, so they are used for business rather than for pleasure.

HERBERT W. BOWEN, *Consul.*
HENRY W. MARTIN, *Vice-Consul.*

SPANISH STEAM MARINE.

In point of tonnage, Spain ranks seventh among the mercantile marine of the world, with 760 vessels above 100 tons net, steam and sail, of a total tonnage of 547,358. The coast of Spain is remarkable for the number of its fine natural harbors, which have conduced in a high degree to the development of the foreign trade of the Kingdom.

The following is a list, with some particulars, of the steam fleets of Spain:

Compañía Transatlántica (Barcelona and Cadiz).—Thirty-two steamers; trade with Puerto Rico, Cuba, Mexico, New York, Liverpool, Philippine Islands, River Plate, and Africa; gross tonnage of fleet, 100,000; subsidized by the Spanish Government for the conveyance of mail.

Pinillos, Saenz & Co. (Cadiz).—Five steamers; run to Puerto Rico, Cuba, Mexico, and the United States; these vessels are of large tonnage and maintain a sea speed of 12 knots.

F. Prats & Co. (Barcelona).—Five steamers, 2,000 tons each; same itinerary as the Pinillos, Saenz & Co. Line.

M. M. de Aarrotegui (Bilbao).—Seven steamers; same itinerary as the two preceding lines. Freight boats.

Compañía de Navegacion La Flecha (Bilbao).—Seven steamers; itinerary, to Liverpool and then the same as the three preceding lines. Freight boats.

Hijo de J. Jover y Serra (Barcelona).—One steamer, 2,000 tons; itinerary, Spain, Puerto Rico, and Cuba.

J. Jover y Costa.—One steamer 2,000 tons; itinerary, Spain to Puerto Rico and Cuba.

Sociedad de Navegacion é Industria (Barcelona).—Four steamers; itinerary, Spain to Canary Islands.

La Betica Empressa de Navegacion á Vapor (Seville).—Twelve steamers; itinerary, Spain to England and Germany. Freight boats.

Compañía Maritima (Barcelona).—Eighteen steamers; itinerary, England and Spanish coasting trade. Freight boats. This and preceding line belong to Macandrew & Co., of London.

P. M. Tintore & Co. (Barcelona).—Four steamers; itinerary, Spain and England. Freight boats.

Compañía Bilbaina de Navegacion (Bilbao).—Six steamers; itinerary, Bilbao to England. Mineral boats.

J. M. Martinez de las Rivas (Bilbao).—Three steamers; itinerary, Bilbao to England. Mineral boats.

Sons of Thomas Haynes (Cadiz).—Eight steamers; itinerary, Spain to North Africa. Freight boats.

Sociedad Isleña Maritima (La Palma and Majorca).—Five steamers; itinerary, Barcelona and Balearic Islands.

Sociedad Mahonesa de Vapores (Mahon).—Three steamers; itinerary, Barcelona to Baleric Islands.

Ybarro & Co. (Seville).—Twenty-one steamers. Coasting trade.

Olavarria, Loza & Co. (Gijon).—Five steamers. Coasting trade.

Meliton, Gonzalez & Co. (Gijon).—Five steamers. Coasting trade

Espalia & Co. (Seville).—Five steamers. Coasting trade.

Compañía Valenciana de Navegacion (Valencia).—Five steamers. Coasting trade.

Among Spanish steamship lines, the Compañía Transatlántica stands preeminent. Twenty steamers of this line maintain a service speed of 12 knots or over, while the latest additions average 14½ to 15 knots. These fast boats are fitted up as armed cruisers, as the company is under contract for the transportation of all official passengers, troops, and stores. It should be noted to their credit that the mail service is performed with marked regularity.

CHAS. L. ADAMS,
Consul.

CADIZ, *March 5, 1895.*

GIBRALTAR.

RAILWAYS.

Gibraltar has no direct railway communication with the Continent of Europe, but it is in close connection with Algeciras, a Spanish seaport town situated on the opposite side of the Bay of Gibraltar, at a distance by sea of 5 miles, or 10 miles by land, where a railway has recently been opened for public passengers and freight traffic under the Spanish railroad laws and requirements.

This railroad starts from the Algeciras pier station on the coast, opposite Gibraltar, and terminates at Bobadilla, where it makes connection with the Andalusian railways, thereby opening up direct communication by rail with Spain, France, and other European countries.

The line to Bobadilla Junction from Algeciras is about 110 miles long. It is in the hands of an English company whose headquarters are in London.

The daily service of the line, which has only one track, consists of six passenger trains—two through and four local trains. There are twenty-two stations on the road between Algeciras and Bobadilla.

The line passes through a rich country of vineyards, orchards, cork-wood, etc., and the scenery throughout is as charming as it is varied. It is in good working order, but on about one-third of the route from Algeciras toward Rondo, owing to the nature of the soil, which becomes boggy during heavy rains, near the side of hills, landslips sometimes occur, which cause a slight interruption in the through traffic. Measures, however, are constantly being taken to obviate this transitory difficulty by laying down many tons of stone to form a firmer foundation wherever required.

By this railway route, the distance between London and Gibraltar can now be covered under three days.

Correspondence for almost all parts of the world is forwarded daily by this route. The mails are conveyed to and brought over from Algeciras by a steam launch employed for that purpose by the British post-office; besides, steamers under the Spanish flag are constantly running between both ports in connection with the trains daily departing from and arriving at the Algeciras pier station, for the accommodation of passengers, luggage, and traffic in general.

This railway route is daily increasing in popularity among travelers in general, and especially with the numerous tourists who are continually arriving at Gibraltar direct from New York by the North German Lloyd steamships, and desire to visit Morocco and the southern parts of Europe, Palestine, and Egypt before proceeding to the northern cities of Europe.

OCEAN LINES.

The North German Lloyd Steamship Company, with its headquarters at Bremen, has a fortnightly line of steamers plying between New York, Genoa, and Naples, calling at Gibraltar to land and embark passengers on their outward and inward trips.

The following are their names: *Kaiser Wilhelm II*, of 6,991 gross tons and 6,500 horsepower; *Spree*, 6,963 gross tons and 12,500 horsepower; *Fulda*, 4,814 gross tons and 6,300 horsepower, and the *Werra*, 4,814 gross tons and 6,300 horsepower.

The time of passage consumed by these steamships is about eight and one-half days from New York to Gibraltar, and eleven days to Genoa or Naples. They offer excellent accommodations for first and second cabin passengers, and have spacious room for a large number of steerage passengers or emigrants.

This company has three other steamships in the same service, but they are principally engaged in conveying freight and carrying steerage passengers. The names of these steamships are: *Kron Prinz Frederick Wilhelm*, of 2,395 tons gross and 1,150 horsepower; *Weser*, of 2,823 tons gross and 1,300 horsepower, and the *Neckar*, of 3,250 tons gross and 3,250 horsepower.

The accommodation for first cabin passengers by these steamships does not equal that of the other steamships belonging to the same company mentioned above; besides, they generally consume twelve days in the voyage from New York to this port.

The Hamburg-American Steamship Company also runs, bimonthly, one of the following steamships between New York and Naples, calling at Gibraltar: *Suevia*, of 3,609 tons gross; *Wieland*, of 3,502 tons gross, and the *Gellert*, of 3,533 tons gross.

Service of different lines.—Among the advantages which these German steamships afford passengers and shippers of cargo, are punctuality in their departures and arrivals at each port and quick passage across the ocean, being quite an improvement over the services of the long-established British Anchor Line, and the Italian Florio and Rubattino companies, whose steamships still continue running on similar voyages, though they have lost much of the patronage formerly enjoyed.

During the year 1893, the North German Lloyd steamships which called at this port from Italian ports on their way to the United States carried 18,390 passengers, chiefly emigrants; the British Anchor Line steamships, 14,622 passengers, and the Italian Florio and Rubattino steamships, 7,914 passengers.

HORATIO I. SPRAGUE,
Consul.

GIBRALTAR, *May 20, 1895.*

GERMANY.

EXPLANATORY REPORT.

I have the honor to report concerning Highways of Commerce, circular of instructions in regard to which reached me March 2, 1895. Answer has been delayed until to-day in order to send the quarterly issue of Statistik des Deutschen Reichs, just published, which contains the figures for the seaport commerce of Germany for the year 1893.

The circular of instruction dates back to the spring of 1894, but was not answered owing to the confusion in the office after the death of Consul-General Edwards. No copy of the circular was found by me in the archives.

I note that the principal consular officers have replied to the circular and in view of the trouble which repetitions would give, would respectfully suggest that I be informed what has been covered by their reports, in order that, to the best of my ability, I may fill any gaps left by them.

Meantime, I have the honor to forward a very complete railway map of Germany, just issued here by Prof. W. Liebenow, which contains the latest information on the subject.[1] I also send a compilation of the more important statistics of the railways of Germany for 1893 (Uebersichtliche Zusammen-Stellung der wichtigsten Angaben der deutschen Eisenbahn-Statistik) which is an official publication containing maps as well as text. This appeared last year. A fourth inclosure covers the movement of vessels on inland waters in Germany during 1893 (Die Binnen-Schiffahrt im Jahre 1893: Berlin, 1895), which is a Government publication.

Trusting that these publications will be of use to those interested, and hoping to receive more specific instructions in accordance with the suggestion above,

I am, etc.,

CHARLES DE KAY,
Consul-General.

BERLIN, *June 13, 1895.*

The above report was received by the Department on the 28th of June, and as the matter for "Highways of Commerce" was already in the hands of the printer, it was impossible to wait until a reply could be obtained from Consul-General De Kay to the additional instructions asked for. The German publications have been utilized so far as practicable in the preparation of the following reports.

---

[1] Filed in Bureau of Statistics, Department of State.

OCEAN LINES.

The following table from the official publication transmitted by Consul-General De Kay shows the number of vessels, with registered tonnage, belonging to the different States of the German Empire having seaports, and the cities of Hamburg and Bremen:

German vessels plying between German countries.

Districts.	Prussia.		Mecklenburg-Schwerin.		Oldenburg.	
	Vessels.	Registered tons.	Vessels.	Registered tons.	Vessels.	Registered tons.
Arrived and departed from—						
The Prussian Baltic district	19,628	1,889,503	430	37,732	122	11,074
The Prussian North Sea district	38,607	1,516,903	41	1,548	2,499	54,728
Mecklenburg-Schwerin	447	41,196	277	6,400	11	520
Oldenburg	3,237	88,582	10	1,033	922	20,171
Lubeck	1,338	123,068	193	6,277	.....	.....
Bremen	1,805	156,254	41	2,024	101	2,421
Hamburg	1,761	369,463	9	331	219	18,563
Total	66,823	4,184,969	1,001	55,345	3,874	107,477
Arrived in and sailed from—						
Baltic district, 1893	21,413	2,053,767	900	50,409	133	11,594
1889	24,338	1,896,679	810	59,348	81	7,123
North Sea district, 1893	45,410	2,131,202	101	4,936	3,741	95,883
1889	38,897	1,266,684	65	3,334	3,072	74,859

Districts	Lubeck.		Bremen.		Hamburg.		German Empire.	
	Vessels.	Registered tons.	Vessels.	Registered tons.	Vessels.	Registered tons.	Vessels.	Registered tons.
Arrived and departed from—								
The Prussian Baltic district	1,329	126,639	364	70,342	444	94,794	22,317	2,230,084
The Prussian North Sea district	.....	.....	1,380	94,511	1,542	304,045	44,069	1,971,735
Mecklenburg-Schwerin	157	4,995	42	2,132	11	870	945	56,113
Oldenburg	.....	.....	176	4,445	279	29,101	4,624	143,332
Lubeck	.....	.....	2	182	.....	.....	1,533	129,527
Bremen	2	63	.....	.....	1,274	302,731	3,223	463,493
Hamburg	1	1,787	1,290	293,496	.....	.....	3,280	683,640
Total	1,489	133,484	3,254	465,108	3,550	731,541	79,991	5,677,924
Arrived in and sailed from—								
Baltic district, 1893	1,486	131,634	408	72,656	455	95,664	24,795	2,415,724
1889	1,299	97,390	280	32,324	427	74,560	27,235	2,167,424
North Sea district, 1893	3	1,850	2,846	392,452	3,095	635,877	55,196	3,262,200
1889	1	35	1,931	227,515	1,513	255,604	45,479	1,828,031

German vessels arriving in and sailing from German ports.

Countries of origin and destination.	Arrived.				Sailed.			
	1893.		1889.		1893.		1889.	
	Vessels (voyages).	Registered tons	Vessels (voyages).	Registered tons.	Vessels (voyages).	Registered tons.	Vessels (voyages).	Registered tons.
European Russia:								
On the White Sea and Arctic Ocean	5	2,596	7	3,228	6	2,699	6	3,519
On the Baltic	400	156,847	785	287,686	641	307,444	1,086	474,495
Sweden	1,307	215,849	1,111	146,952	1,104	274,624	881	177,172
Norway, with Spitzbergen	173	19,319	232	21,537	213	41,749	233	30,335
Denmark, with Iceland and Faroe Islands	2,030	278,223	2,120	244,322	2,343	291,922	2,258	227,990
Great Britain and Ireland *a*	2,718	1,295,167	3,174	1,505,762	2,345	1,143,738	2,739	1,271,968
Netherlands	252	73,872	413	79,001	357	147,065	450	112,406
Belgium	200	117,417	216	116,907	158	86,561	207	106,356
France	106	68,471	117	62,111	184	88,926	129	62,935
Spain, with Gibraltar and Portugal, including the Azores	121	73,005	104	53,523	83	46,300	99	45,696
Italy and Malta	53	73,162	41	43,230	46	49,544	38	40,688
Austria-Hungary	18	21,440	13	10,696	19	20,418	17	14,996
European Turkey and Greece	31	42,431	2	1,958	34	43,028	1	41
Roumania and Russia on the Black Sea	21	24,936	17	17,996	11	13,165	15	16,585
Not specified	.....	.....	6	47	7	222	16	810
British North America on the Atlantic, including Greenland	26	54,159	16	25,052	30	60,677	21	30,554
United States of America on the Atlantic	488	1,210,555	495	975,659	501	1,250,615	467	967,525
Mexico and Central America on the Atlantic	33	38,777	37	29,852	31	45,330	34	34,674
West India Islands	72	92,085	60	67,854	59	86,051	53	74,394
South America on the Atlantic, north of Brazil	8	5,088	6	2,063	11	3,041	25	7,179
Brazil	99	151,906	126	193,436	131	164,412	159	205,864
South America on the Atlantic, south of Brazil	96	159,969	42	74,131	92	153,081	63	101,220
Chile and other South American countries on the Pacific	111	171,059	129	137,529	78	126,192	85	102,689
Mexico and Central America on the Pacific	7	4,212	10	5,295	8	6,505	11	5,079
United States of America and British America on the Pacific	1	960	2	1,729	.....	.....	2	1,906
Africa on the Mediterranean Sea	3	2,387	1	753	.....	.....	.....	.....
Cape Colony, with Natal	2	2,019	.....	.....	6	5,469	3	997
Africa on the Atlantic, including the German Protectorate	*b* 67	69,930	*c* 38	39,141	*d* 69	71,815	*e* 44	45,033
Africa on the Indian Ocean and Red Sea, including the German Protectorate	*f* 16	25,690	7	3,002	*g* 18	24,664	8	5,790
Asia on the Mediterranean and Black seas	5	5,617	2	323	3	3,509	4	593
Asia and the East Indies, with the Indian Islands	78	147,432	49	65,434	56	112,889	23	35,062
China, Japan, and Eastern Asia	41	88,483	39	70,243	47	97,908	45	73,909
Australia and Pacific Ocean islands, including German Protectorate	28	64,292	*h* 17	26,323	*i* 35	72,250	48	68,408

a In the figures ior 1889 the traffic with Heligoland, which island was then owned by Great Britain, is included (186 vessels of 38,283 registered tons arrived from there, and 199 vessels of 38,989 registered tons sailed thither). *b* Of this number 2 were vessels of 1,304 registered tons, which arrived from ports of the German protectorates in Africa in the Atlantic Ocean. *c* Of these 1 was a vessel of 1,286 registered tons, which arrived from ports of the German protectorates in Africa in the Atlantic Ocean. *d* Of these 1 was a vessel of 1,079 registered tons, which sailed to ports of the German protectorates in Africa in the Atlantic Ocean. *e* Of these 3 were vessels of 2,614 registered tons, which sailed to ports of the German protectorates in Africa in the Atlantic Ocean. *f* Among these were 13 vessels of 24,058 registered tons, which arrived from ports of the German protectorates in Africa in the Indian Ocean. *g* Among these were 12 vessels of 22,271 registered tons, which sailed to ports of the German protectorates in Africa in the Indian Ocean. *h* Among these were 2 vessels of 883 registered tons, which arrived from ports of the German protectorates in New Guinea and the islands of the Pacific Ocean. *i* Among these was 1 vessel of 410 registered tons, which sailed to ports of the German protectorates in New Guinea and the islands of the Pacific Ocean.

Vessels to or from German ports.

Year.	Arrived from—				Sailed to—			
	Europe, exclusive of Germany.		Countries not in Europe.		Europe, exclusive of Germany.		Countries not in Europe.	
	Vessels (voyages).	Registered tons.	Vessels (voyages).	Registered tons.	Vessels (voyages).	Registered tons.	Vessels (voyages).	Registered tons.
1893.....	7,435	2,462,735	1,181	2,294,620	7,551	2,557,405	1,175	2,284,408
1889.....	8,358	2,594,956	1,076	1,717,819	8,175	2,585,992	1,095	1,760,876

PORTS OF THE GERMAN EMPIRE.

According to the Statesman's Year Book for 1895, the shipping at the seven principal ports of the German Empire in 1892 was as follows:

Ports.	Number.	Tonnage.	Ports.	Number.	Tonnage.
Hamburg: *a*			Lubeck: *c*		
Entered	8,829	5,683,353	Entered	2,425	516,963
Cleared	9,057	5,742,821	Cleared	2,427	524,236
Stettin:			Neufahrwasser (Dantzig):		
Entered	3,762	1,233,541	Entered	1,582	584,478
Cleared	3,700	1,230,486	Cleared	1,576	577,098
Bremen: *b*			Konigsberg:		
Entered	3,095	1,358,191	Entered	1,330	397,556
Cleared	3,060	1,350,855	Cleared	1,397	426,448
Kiel:					
Entered	3,611	591,680			
Cleared	3,634	580,726			

a Including Cuxhaven. *b* Including Bremerhaven and Vegesack. *c* Including Travemunde.

OCEAN MAIL STEAMERS.

In the annual report of the United States Commissioner of Navigation for 1894, under the heading, "Ocean Mail Compensation and Subsidies," pp. 99, 100, the following information as to the steamship lines of Germany is given:

Less than 4 per cent of the net tonnage of Germany's merchant marine receives direct subsidies from the imperial treasury for carrying the mails. The German merchant marine for 1893 comprised 3,728 vessels of 1,511,579 register (net) tons. Nineteen steamships of 51,800 register tons received direct postal subsidies to the amount of 4,990,000 marks (mark = 23.8 cents), in round numbers $1,240,000. The distance traversed was 999,622 miles, making the average payment per mile $1.25. In response to the inquiry of this Bureau, through the proper official channels, the German imperial foreign office has furnished the following statement of details of the operations of the German postal subsidy law in force April, 1894:

Contracting company.	Routes.	Trips per annum.	Miles per annum.	Number and register (net) tonnage each of steamers required.	Speed.	Subsidy.
					Knots.	*Marks.*
North German Lloyd.	1. Bremerhaven-Shanghai ..	13	300,534	5 at least 4,500 register tons.	12	4,090,000
	2. Hongkong-Yokohama ...	13	44,096	1 at least 1,500 register tons. *a*	11½	
		6	48,327	.....do	9	
	3. Singapore-New Guinea ..	13	340,730	5 at least 3,000 register tons.	11½	
	4. Bremerhaven-Sydney....	13	230,965	4 at least 2,200 register tons.	10½	
German East Africa-Hamburg Line.	1. Hamburg-Natal.....	13	15,665	1 at least 500 register tons.	(*b*)	900,000
	2. Dar-es-Salaam-German coast ports.	13	19,305	.....do	(*b*)	
	3. Mozambique-Portuguese coast ports.					
	Total	84	999,622	19 at least 51,800 register tons.	.....	4,990,000

a One reserve for lines 2 and 3. *b* Connecting with main line.

The foreign office states that the same arrangement was in force during 1893. The German subsidy law, under which the arrangement with the East African-Hamburg line exists, was enacted February 1, 1890, and has since been unchanged. The law under which the arrangement with the North German Lloyd exists was enacted April 6, 1885. It originally provided also a subsidy of 400,000 marks annually for fifteen years for two steamships of not less than 2,000 net tons, making annually 26 trips (48,880 miles) from Trieste and Brindisi to Port Said. The North German Lloyd abandoned this subsidy in 1892 as a source of loss, and the subsidy has been reduced to 90,000 marks, in return for which its Asiatic and Australian lines stop at Naples or Brindisi. In unusual cases the Government does not insist on penalties for failure to maintain the statutory rate of speed, 11½ knots on the Asiatic and Australian lines. Government compensation, coupled with Government requirements in this case, was a source of loss rather than profit. Bearing on this matter is the following from the annual report of the North German Lloyd Steamship Company for 1893:

"The Government mail steamer line to east Asia and Australia has been satisfactorily developed in the past year. This was accomplished by remodeling the subvention contract, also by the use of suitable steamships, and finally by the increase of freight on the east Asiatic line. We are plessed to report that the Government mail steamer line, which in the year 1892 was carried on at a loss of 35,040 marks, has, during the current year, in addition to its contribution to the premium fund arising from insuring our own vessels, made a clear business profit of 1,184,135 marks."

While no other subsidies are mentioned, Germany pays also to steamships, aggregating about 30,000 net tons, compensation at moderate rates for carrying mails to the United States, and doubtless for a like service to certain Baltic ports.

BREMEN AND HAMBURG LINES.

The report of the United States Commissioner of Navigation for 1894 has the following information as to the North German Lloyd (Bremen) and Hamburg-American lines (Hamburg):

The following reports have been selected as best and most fully illustrating the modes and extent of German steam navigation, considered from the economic point of view. The operations of the North German Lloyd Company are on the Atlantic and Mediterranean and, via the Suez Canal, the Indian and Pacific; of the Hamburg-American on the Atlantic. The various lines operated by these corporations connect Germany with North and South America, the West Indies, Asia, and Australia. The North German Lloyd Company began operations in 1856. The report is for the calendar year ended December 31, 1893, when the fleet of the company consisted of 80 steamships (including 6 under construction), of 225,097 gross tons and 202,731 horsepower, and 78 tenders, barges etc., of 15,955 tons, the most powerful steamships being the *Havel* and *Spree*, of 6,963 gross tons and 12,500 horsepower each. * * *

The Hamburg-American Steamship Company began operations in 1846. The report is for the calendar year ended December 31, 1893, when the fleet of the company consisted of 51 steamships of 155,806 gross tons and 99,725 horsepower, and 41 river steamers, lighters, barges, sloops, etc., the most powerful steamships being the *Fürst Bismarck*, of 8,874 gross tons and 16,400 horsepower, and the *Normannia*, of 8,250 gross tons and 16,000 horsepower. * * *

North German Lloyd.—The following data are extracted from the latest report of the company:

The business year [calendar year 1893] began under unfavorable conditions. On account of the prevailing cholera epidemic in Hamburg, America placed restrictions on immigration into that country, and up to March 1 of the past year we were obliged to discontinue carrying steerage passengers to the United States. On our lines to

South America, to Australia and east Asia, the condition of the freight markets offered little encouragement for the statisfactory development of business. These conditions improved with the beginning of spring by active immigration to the United States, which continued far into the summer months, but on account of the financial depression in the United States was entirely stopped in the autumn.

* * * * * * *

The Government mail steamer lines to east Asia and Australia have been satisfactorily developed in the past year. This was accomplished by remodeling the subvention contract, also by the use of suitable steamships, and finally by the increase of freight on the east Asiatic line. We are pleased to report that the Government mail steamer line, which in the year 1892 was carried on at a loss of 35,040 marks, has during the current year, in addition to its contribution to the premium surplus of the insurance fund, a business surplus of 1,184,134.55 marks to its credit. This surplus is lessened, however, by 188,945.90 marks, a part of the cost of rebuilding the steamers *Bayern* and *Sachsen*, which we have taken from this line. In the New Guinea line we have placed our steamer *Lubeck;* for the trips of this steamer we have always had ample freight.

The lines Bremen-New York and Bremen-Baltimore have made good returns for the months of March to August. The Roland line, opened in April, which we were obliged to carry on during the past year almost entirely by chartered vessels, has, to our satisfaction, developed a marked increase in valuable traffic via Bremen. We have placed on this line in the course of the year our newly acquired steamer *Roland*. In April and May the two twin-screw steamers *Wittekind* and *Willhad* will be placed in service, and it will then be possible to establish regular trips every fourteen days via the Roland line between Bremen and New York. As far as practicable we will, besides this, employ some of our older steamers on emergency on the Roland line.

The express steamship line between Genoa and New York has been well developed. After the Hamburg-American Company decided on its own behalf to establish a fast steamship service between New York, Naples, and Genoa during the winter months, at the close of the year we opened negotiations with this company for arrangements to carry this traffic jointly during the winter months on this line, with weekly expeditions. These negotiations led in the course of the year to a satisfactory agreement as regards the proportionate division of the profits resulting from this common line. We may hope that the pleasant relations resulting from this joint service will offer special inducements to passengers as well as increased offers for freight traffic. The agreement, by lessening competition on both sides, will be to the advantage of both companies.

The good results of the lines between Naples and New York, begun in April of last year, have induced us to establish an independent line between these two places, which we have also, since the beginning of this year, carried on jointly with the Hamburg-American Company, and on which we have placed our steamers *Kronprinz Friedrich Wilhelm* and *Weser*, also the disengaged steamer *Neckar*, from the Government mail steamer lines. During the last few weeks we have extended the trips of the steamers on this line to Messina and Palermo. We intend to relieve the steamer *Weser* by the former Government mail steamer *Braunschweig*. With our steamer *Danzig* we continue regular weekly trips between Genoa, Naples, and Palermo.

On account of the revolution in Brazil our Brazil line has retrograded since our last report; but, thanks to the efficacious protection of the German war vessel stationed at Rio de Janeiro during the disturbance, we were enabled to continue our regular intercourse with that harbor without trouble.

The La Plata line has remained without important changes. The contract entered into with the Hansa Company, also the agreement with the English lines interested in the La Plata traffic, as far as these lines connect with Antwerp, has in a measure lessened competition in regard to freight business; still, on account of the proportionately small amount of freight offered, it has been impossible materially to

improve freight rates. Toward the close of the year we placed the steamers *Pfalz* and *Mark*, built for the La Plata line, in service between Bremen and Buenos Ayres. We feel justified, on account of the splendid passenger accommodations of these steamers, of which passengers will undoubtedly avail themselves, to change our fourteen days' connection with Bremen, Antwerp, Corunna, Vigo, and La Plata, so that every second steamer will stop at Southampton also for taking and landing passengers.

A comparison of the passenger traffic on the transoceanic trips show the following figures:

Lines.	1893.		1892.	
	Outgoing passengers.	Incoming passengers.	Outgoing passengers.	Incoming passengers.
New York line	108,543	48,531	95,246	39,147
Baltimore line	20,586	4,409	44,746	3,850
South American line	4,866	2,542	3,117	4,349
East Asia line	6,030	3,266	4,515	1,749
Australian line	2,340	2,145	2,721	2,671
Total	203,258		202,111	

Up to December 31, 1893, the Norddeutscher Lloyd carried, on transoceanic trips, 2,957,996 passengers.

The results of the European lines were not without profit. The express steamer connection, Bremerhaven-Norderney, has developed satisfactorily, as mentioned in the report of last year.

We intend during the current year, besides the daily connection with Bremerhaven-Norderney to make three trips each week to Borkum via Norderney by means of our fast steamer *Najade*, to be delivered in the middle of June. In compliance with the wishes of the frequenters of the North Sea baths, and especially those of the western part of Germany, we have established during the year a daily connection between Bremerhaven and Heligoland and return, which we intend to continue. Pursuant to an agreement with one of the German railroad companies, the majority of our summer tickets will be honored on that line also for the traffic between Bremerhaven, Hamburg. Leer, Emden, and Norden; also, the majority of the summer tickets for Heligoland will be honored for the traffic from Bemerhaven and Hamburg. The connecting trains should have sleepers direct, Berlin-Bremerhaven and Leipzig-Bremerhaven.

* * * * * * *

The contract entered into with other continental steamship companies for passenger traffic to North America has been extended over the current year. In order to lessen the competition for freight, we entered into an agreement with the same companies in regard to freights. And, finally, we have agreed with the Hamburg-American Line by which both companies are to receive their share of the American cabin-passenger business.

* * * * * * *

The lengthening of our steamers *Bayern* and *Sachsen* has been done by the firm of Blohm & Voss, in Hamburg, to our entire satisfaction. The verdict of the public has been unanimous that these two vessels are the best arranged and furnished steamers on the Government mail-steamer line in the business to East Asia. We intend to lengthen our steamer *Preussen* in the same way.

The firm of F. Schishau, in Danzig, has the contract for two fast mail steamers, one of which received the name of *Prinz-Regent Luitpold* while being launched, and the other will be named *Prinz Heinrich*, and will be placed in service this summer. We may hope that after the installation of these vessels the Norddeutscher Lloyd, on the line to east Asia, will be in position to win first place against competing steamer companies.

For the Roland line we bought last year from the firm of Sir W. G. Armstrong, Mitchell & Co., in Newcastle, the steamer *Roland*, which was then under construction; also gave orders for two steamers to the firm of Blohm & Voss, in Hamburg. The last two, twin-screw steamers, as also the *Roland*, are to have the best steerage arrangements, and are to be named *Wittekind* and *Willehad*.

The steamers *Pfalz* and *Mark* have been delivered and are satisfactory, and we hope that these steamers, in the traffic to La Plata, will do honor to the Norddeutscher Lloyd. In payment for the steamers *Pfalz* and *Mark* we have given our steamers *Ohio* and *Frankfurt*.

Of the two steamers contracted for with the firm of Möller & Holberg, in Garbow, for the European line, we have received our steamer *Albatross*. We expect to receive the steamer *Falke* soon.

The freight steamer ordered from G. Seebeck, in Geestemunde, has in the meantime been delivered and is satisfactory. The steamer *Lloyd* has been rebuilt, which gives us a first-class passenger boat for the Unterweser.

For the traffic to Norderney and Borkum we have a new fast steamer (salon), which is to have a speed of 16½ miles (contract to that effect), ordered from the firm of F. Schichau, in Elbing. This steamer will be delivered in June of the current year, and be named *Najade*.

We are now engaged on the plans for building another fast steamer for the New York line.

Hamburg-American Packet Company.—From the report of the Hamburg-American Packet Company for the calendar year 1893 the following extracts are taken:

We regret that we feel obliged to suggest that no dividend be declared for the past business year, on account of the present depreciation in the value of our vessels. On account of the numerous inventions and improvements which have been made in recent years in machinery and vessel construction, old steamers can be utilized with profit only if their book value can be lowered an unusual degree. Again, in consequence of the depressed condition of the shipping business, new vessels can be contracted for at lower figures than ever before. The administration of a steamship company which fully recognizes its responsibilities dare not neglect at this time to strive to bring the book value of its flotilla, as far as possible, up to the standard required by circumstances.

The cholera epidemic has influenced our earnings in the past year almost as much as did the great catastrophe of the foregoing year. Passenger as well as freight traffic suffered continually from lack of confidence, at home and abroad, in the sanitary condition of Hamburg. We were therefore obliged, as far as possible, to contract with friendly steamer companies to seek traffic which was turned away from Hamburg in other harbors. We were successful, although not without great expense and unusual effort, by running our vessels to the Scandinavian and Italian harbors, also to Antwerp, and thus attained nearly the same amount of business as in former years.

We were affected adversely by the decree of the State authorities, which, for sanitary reasons, ordered the discontinuance of the Russian immigration movement, which constituted 50 per cent of all the immigration through Hamburg during recent years. On this account our income was not only lessened by millions, but we were obliged to refund about 500,000 marks, for which amount we had sold passage assignments (called prepaid tickets) to people in America who wished to send for their relatives from the old country, as we were unable to carry out the agreement.

At the beginning of this year we were successful, thanks to the friendly assistance received from our chamber of commerce, in securing the recall of the interdict, so far as traffic of Hamburg was concerned, with conditions, however, which even to-day put us at a disadvantage with all other harbors.

Although we hope that these conditions will soon be entirely withdrawn, and that at last a parity between Hamburg and competing harbors will be reestablished, the sad experiences of past years have made it necessary for us to make arrangements, should it again be necessary to impose extraordinary regulations, for the possible transfer of our business and thus avoid another risk to the existence of our enterprise.

For this purpose we have entered into an agreement with the Norddeutscher Lloyd that we be allowed to transfer our business to Bremen should there be a recurrence of cholera; and in order to be prepared in every way we have closed a contract to lease from the Oldenburg state authorities the Oldenburg Harbor, Nordenham, opposite Bremerhaven, a part of the pier and room for storage, which we are using at the present time for our sailings to West Indies.

Hand in hand with the losses through the abnormal conditions on this side was the unfortunate circumstance of the long crisis in the United States, which had its effect on the North Atlantic passenger and freight traffic. The unfortunate condition of trade, the dread of another cholera epidemic in Europe, and also the attractions of the Exposition in Chicago, worked together greatly to reduce the yearly American cabin passenger traffic toward Europe every spring and back again in the autumn. The traffic which went from Europe to the Exposition in Chicago was very meager, and most of this was second class, instead of first class, and therefore did not in any way compensate us for the loss of our normal business.

Finally the sensational reports of the return of sporadic cases of cholera in September, especially as reported in the United States, as a forerunner of another epidemic, caused still heavier losses and shrinkage in our business and compelled us at times to change the trips of our express steamers to Wilhelmhaven.

Through the extraordinary assistance and protection rendered us by the imperial authorities, in a few days, and mostly by telegraph, it was possible to make the difficult arrangements necessary for transferring such a business so that we could continue our expeditions without interruption.

The contract of the North Atlantic steamship companies has given satisfaction to the united parties during the past year, and has been the cause of still closer relations between us and the Norddeutscher Lloyd. We have closed a contract for several years with the administration of the Norddeutscher Lloyd, by which we in common shall carry on, not only the lines between New York and the Mediterranean, but also the cabin traffic to and from Hamburg, Bremen, Southampton, as also the out-going freight traffic; and have regulated the division of receipts, and thus set aside competition between our companies. That through this union the earning capacity of the two companies is greatly increased is certain, and there is no doubt that this union of the German companies gives a power which will be sufficient to keep competition within bounds and afford protection against all competitors.

The results of the West India Merchant Line were satisfactory, although the traffic was naturally affected by the unfavorable circumstances cited above. It was possible to extend the voyages of this line, in that we increased the number of expeditions from seven to eight per month, at the same time making new connections with Jamaica and harbors of the island of Cuba.

A step of great importance, from which we certainly expect great results for the development of our corporation, is the construction of four immense twin-screw steamers, which are not only arranged for steerage and freight traffic, but also especially adapted on a large scale for forwarding live stock and the transportation of meat in cold storage. These steamers, which can be arranged to carry about 2,500 steerage passengers each, and, by utilizing their entire capacity, can load very near 7,500 tons freight, are, by the use of all the new inventions and improvements, so economical in regard to running expenses that we are guaranteed a speed of 13 miles per hour with a consumption of coal of only 55 or 60 tons per day.

The first of these two vessels (445 feet long, 50 feet wide, and 34 feet deep), which are being constructed in the well-known shipyard of Harlan & Wolff, in Belfast,

and which we have named *Prussia* and *Persia*, are to be delivered in the spring. With the two contracted for in Germany, with the Vulcan Works, in Stettin, and Blohm & Voss, of Hamburg, we have increased the dimensions still further. These vessels will be 460 feet long, with a width of 52 feet and a depth of 35 feet.

Two steamers of the West India line, *India* and *Europa*, which are too small for our trade, we sold to firms in this place, and bought from the German-Australian Steamship Company two steamers built in 1889 and only recently supplied with new boilers, named *Barmen* and *Eberfeld*.

On December 1 of last year we transferred our works from the American quay to the Petersen quay, behind which we have erected our repair shops, which were partially destroyed by fire in 1892.

The equipment magazine has again been erected on the place near our dry dock.

During the year 1893, 315 round trips were made, on which 103,114 passengers of all classes and 1,226,354 cubic meters freight were transported.

The report gives the following list of steamships, barges, lighters, etc., belonging to the company: Fifty-one seagoing steamships, *Albingia*, *Allemannia*, *Ascania*, *Augusta Victoria*, *Australia*, *Baumwall*, *Bavaria*, *Bohemia*, *Borussia*, *California*, *Cheruskia*, *Colonia*, *Columbia*, *Cremon*, *Croatia*, *Dania*, *Europa*, *Flandria*, *Francia*, *Fürst Bismarck*, *Galicia*, *Gellert*, *Gothia*, *Grimm*, *Helvetia*, *Holsatia*, *Hungaria*, *India*, *Italia*, *Kehrwieder*, *Markomannia*, *Moravia*, *Normannia*, *Polaria*, *Polynesia*, *Rhenania*, *Rhaetia*, *Rugia*, *Russia*, *Saxonia*, *Scandia*, *Slavonia*, *Steinhoft*, *Suevia*, *Teutonia*, *Thuringia*, *Valesia*, *Venetia*, *Virginia*, *Wandrahm*, *Wieland;* 2 twin-screw steamers, under construction; 8 river steamers, 6 steam sloops, 1 steam hoisting machine, 3 box barges, 1 barge, 21 iron lighters, 2 lighters at St. Thomas.

TONNAGE OF GERMAN STEAMSHIPS.

The report of the Commissioner of Navigation, 1894, pages 183 and 184, gives the following figures of tonnage, etc., of vessels belonging to the North German Lloyd, Hamburg-American, and Union lines:

NORTH GERMAN LLOYD.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Havel	German	6,963	Steel	1890	180	.....
Spree	do	6,963	do	1890	180	.....
Lahn	do	5,097	do	1887	180	.....
Saale	do	4,965	do	1886	180	.....
Trave	do	4,966	do	1886	180	.....
Aller	do	4,964	do	1885	180	.....
Elbe	do	4,510	Iron	1881	180	.....
Munchen	do	4,796	Steel	1889	60	.....
H. H. Meier	do	5,306	do	1892	60	.....
Roland	do	3,660	do	1893	60	.....
Wittekind	do	4,990	do	1889	60	.....
NAPLES.						
Ems	German	4,728	Iron	1884	180	.....
Fulda	do	4,814	do	1882	180	.....
Werra	do	4,815	do	1882	180	.....
Kaiser Wilhelm II	do	6,991	Steel	1889	180	.....
		90,067			2,460	*a* $8,000,000

a Approximate.

HAMBURG-AMERICAN LINE.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
EXPRESS.						
Augusta Victoria	German	7,761	Steel	1889	300	
Columbia	do	7,363	do	1889	300	
Fuerst Bismarck	do	8.874	do	1890	300	
Normannia	do	8,250	do	1890	300	
SCANDIA LINE.						
Virginia	German	2,884	Steel	1891	75	
Venetia	do	2,891	do	1891	75	
Slavonia	do	2,274	Iron	1883	75	
Gothia	do	2,433	do	1884		
MEDITERRANEAN.						
Suevia	German	3,609	Iron	1874	75	
Wieland	do	3,504	do	1874	75	
Gellert	do	3,533	do	1874	75	
HAMBURG.						
Scandia	German	4,375	Iron	1889	75	
Bohemia	do	3,423	do	1881	75	
Russia	do	4,017	do	1889	75	
Moravia	do	3,739	do	1883	40	
Dania	do	4,379	Steel	1889	75	
Rhaetia	do	3,553	do	1883	40	
Rugia	do	3,467	Iron	1882	40	
California	do	2,690	do	1883	40	
Italia	do	3,498	Steel	1889	40	
Prussia	do	5,937	do	1894	75	
Persia	do	6,000	do	1894	75	
Grimm	do	2,599	do	1890	40	
		101,053			2,340	*a* $6,000,000

UNION LINE—HAMBURG, NEW YORK, AND NAPLES.

Amalfi	German	2,345	Iron	1881	40	$300,000
Marsala	do	2,397	do	1882	40	370,000
Taormina	do	2,422	do	1884	40	465,000
Sorrento	do	2,362	do	1881	40	325,000
		9,526			160	1,460,000

a Approximate.

RAILROADS.[1]

I.

State Railways and Private Railways Managed by the State.

Railways of the Empire in Alsace-Lorraine.—Entire length, 1,412.86 kilometers,[2] of which 1,395.88 were in Alsace-Lorraine and 16.98 in Prussia.

Military Railway.—Entire length, 45.61 kilometers; all in Prussia.

Prussian State railways.—Entire length, 25,596.02 kilometers, of which 23,837.55 were in Prussia, 142.04 in Saxony, 111.53 in Hesse, 125.47 in Mecklenburg-Schwerin, 155.95 in Saxe-Weimar, 72.94 in Mecklenburg-Strelitz, 62.65 in Oldenburg, 354.46 in Brunswick, 36 in Saxe-Meiningen, 0.93 in Saxe-Altenburg, 188.41 in Saxe-Coburg-Gotha, 268.03 in Anhalt, 14.86 in Schwarzburg-Rudolstadt, 49.45 in Schwarzburg-Sondershausen, 17.08 in Waldeck, 16.86 in Reuss (new line); 24.32 in Schaumburg-Lippe, 29.30 in Lippe, 42.11 in Bremen, 35.45 in Hamburg, 5.26 in Austria, and 5.37 in the Netherlands.

[1] Translated from Consul-General De Kay's inclosure, German Railway Statistics.

[2] Kilometer equals 0.62137 mile.

Bavarian State railways.—Entire length, 4,991.34 kilometers, of which 4.62 were in Prussia, 4,912.82 in Bavaria, 22.50 in Saxe-Meiningen, 4.17 in Saxe-Coburg-Gotha, and 47.23 in Austria.

Saxon State railways.—Entire length, 2,364.47 kilometers, of which 12.62 were in Prussia, 2,105.32 in Saxony, 39.82 in Saxe-Weimar, 0.83 in Saxe-Meiningen, 98.08 in Saxe-Altenburg, 35.34 in Reuss (old line), 46.90 in Reuss (new line), and 25.56 in Austria.

Wurtemberg State railways.—Entire length, 1,664.52 kilometers, of which 69.72 were in Prussia, 8.13 in Bavaria, 1,486.90 in Wurtemberg, and 99.77 in Baden.

State railways of Baden.—Entire length, 1,429.10 kilometers, of which 20.96 were in Prussia, 0.03 in Bavaria, 24.15 in Wurtemberg, 1,320.63 in Baden, 22.17 in Hesse, and 41.16 in Switzerland.

Main-Neckar Railway, with that of Eberstadt and Pfugstadt.—Entire length, 96.95 kilometers, of which 6.91 were in Prussia, 38.78 in Baden, and 51.26 in Hesse.

Upper Hessian railways.—Entire length, 220.22 kilometers, of which 28 were in Prussia, and 192.22 in Hesse.

Mecklenburg Friedrich Franz Railway, with that of Weimar and Karow.—Entire length, 694.56 kilometers, of which 625.67 were in Mecklenburg-Schwerin, 62.01 in Oldenburg, and 6.88 in Lubeck.

State railways of Oldenburg.—Entire length, 396.42 kilometers, of which 82.92 were in Prussia, 307.55 in Oldenburg, and 5.97 in Bremen.

Weimar, Berka and Blankenhain Railway.—Entire length, 32.08 kilometers; all in Saxe-Weimar.

The entire length of the German State railways was 38,944.17 kilometers—in Alsace-Lorraine, 1,395.88 kilometers; in Prussia, 24,125.89 kilometers; in Bavaria, 4,920.98 kilometers; in Saxony, 2,247.36 kilometers; in Wurtemberg, 1,511.05 kilometers; in Baden, 1,459.18 kilometers; in Hesse, 377.18 kilometers; in Mecklenburg-Schwerin, 751.14 kilometers; in Saxe-Weimar, 227.85 kilometers; in Mecklenburg-Strelitz, 134.95 kilometers; in Oldenburg, 370.20 kilometers; in Brunswick, 354.46 kilometers; in Saxe-Meiningen, 59.33 kilometers; in Saxe-Altenburg, 99.01 kilometers; in Saxe-Coburg-Gotha, 192.58 kilometers; in Anhalt, 268.03 kilometers; in Schwarzburg-Rudolstadt, 14.86 kilometers; in Schwarzburg-Sondershausen, 49.45 kilometers; in Waldeck, 17.08 kilometers; in Reuss (old line), 35.34 kilometers; in Reuss (new line), 63.76 kilometers; in Schaumburg-Lippe, 24.32 kilometers; in Lippe, 29.30 kilometers; in Lubeck, 6.88 kilometers; in Bremen, 48.08 kilometers; in Hamburg, 35.45 kilometers; in Austria, 78.05 kilometers; in the Netherlands, 5.37 kilometers; in Switzerland, 41.16 kilometers.

II.

Private Railways Under State Management.

The entire length of the private railway lines under State management was 103.93 kilometers, divided as follows:

Birkenfeld Railway.—Length, 5.23 kilometers; all in Oldenburg.

Farge and Vegesack Railway.—Length, 10.44 kilometers, of which 10.33 were in Prussia and 0.11 in Bremen.

Ilme Railway.—Length, 13.25 kilometers; all in Prussia.

Kreis Oldenburg Railway.—Length, 23.12 kilometers; all in Prussia.

Zittau and Reichenberg Railway.—Length, 26.61 kilometers, of which 4.97 were in Saxony and 21.64 in Austria.

Altenburg-Zeitz Railway.—Length, 25.28 kilometers, of which 11.75 were in Prussia and 13.53 in Saxe-Altenburg.

Of the private railway lines under State management 58.45 kilometers were in Prussia, and the rest as above stated.

III.

Private Railways Under Private Management.

Dortmund, Gronau and Enschede Railway.—Length, 96.89 kilometers; all in Prussia.

Lubeck and Buchen Railway.—Length, 126.18 kilometers, of which 86.50 were in Prussia, 34.94 in Liibeck, and 4.74 in Hamburg.

Marienburg and Mlawka Railway.—Length, 149.32 kilometers; all in Prussia.

East Prussian Southern Railway, and that of Fischhausen and Palmnicken.—Length, 261.27 kilometers; all in Prussia.

Alt Damm and Colberg Railway.—Length, 122.27 kilometers; all in Prussia.

Altona and Kaltenkirchen Railway.—Length, 36.07 kilometers; all in Prussia.

Breslau and Warsaw Railway.—Length, 55.34 kilometers; all in Prussia.

Crefeld Railway.—Length, 60.86 kilometers; all in Prussia.

Cronberg Railway.—Length, 9.62 kilometers; all in Prussia.

Dahme and Uckro Railway.—Length, 12.53 kilometers; all in Prussia.

Eisean and Siegen Railway.—Length, 12.20 kilometers; all in Prussia.

Georgs Marienhutte Railway.—Length, 7.30 kilometers; all in Prussia.

Hoya Railway.—Length, 6.91 kilometers; all in Prussia.

Kiel and Flensburg Railway.—Length, 78.78 kilometers; all in Prussia.

Konigsberg and Cranz Railway.—Length, 28.30 kilometers; all in Prussia.

Neuhaldensleben Railway.—Length, 31.71 kilometers; all in Prussia.

Osterwieck and Wasserleben Railway.—Length, 5.18 kilometers; all in Prussia.

Paulinenane and Neu Ruppin Railway.—Length, 28.08 kilometers; all in Prussia.

Peine and Ilsede Railway.—Length, 7.95 kilometers; all in Prussia.

Prignitz Railway.—Length, 44.93 kilometers; all in Prussia.

Schleswig and Angeln Railway.—Length, 21.46 kilometers; all in Prussia.

Stargard and Custrin Railway.—Length, 116.36 kilometers; all in Prussia.

Stendal and Tangermunde Railway.—Length, 13.23 kilometers; all in Prussia.

Warstein and Lippstadt Railway.—Length, 30.88 kilometers; all in Prussia.

Wittenberg and Perleberg Railway.—Length, 10.54 kilometers; all in Prussia.

Zschipkan and Finsterwalde Railway.—Length, 20.16 kilometers; all in Prussia.

Eutin and Lubeck Railway.—Length, 39.87 kilometers, of which 34.79 were in Oldenburg and 5.08 in Lubeck.

Hessian Ludwig Railway.—Length, 696.76 kilometers, of which 154.16 were in Prussia, 9.15 in Bavaria, 26.96 in Baden, and 506.49 in Hesse.

Ludwig Railway (Nurnberg-Furth).—Length, 6.04 kilometers; all in Bavaria.

Neustrelitz-Warnemünde Railway.—Length, 127.71 kilometers, of which 114.61 were in Hesse and 13.10 in Mecklenburg-Strelitz.

Palatinate Railways.—Length, 675.22 kilometers, of which 11.72 were in Alsace-Lorraine, 0.58 in Prussia, and 654.92 in Bavaria.

Saal Railway.—Length, 93.87 kilometers, of which 0.47 were in Prussia, 33.09 in Saxe-Weimar, 16.32 in Saxe-Meiningen, 28.53 in Saxe-Altenburg, and 15.46 in Anhalt.

Weimar and Gera Railway.—Length, 68.65 kilometers, of which 29.75 were in Saxe-Weimar, 0.61 in Saxe-Meiningen, 23.25 in Saxe-Altenburg, and 15.04 in Reuss (younger line).

Werra Railway.—Length, 216.12 kilometers, of which 12.81 were in Prussia, 17.85 in Saxe-Weimar, 122.41 in Saxe-Meiningen, and 63.05 in Saxe-Coburg-Gotha.

Arnstadt and Ichtershausen Railway.—Length, 5.12 kilometers, of which 1.72 were in Saxe-Coburg-Gotha and 3.40 in Schwarzburg-Sondershausen.

Bavarian Railways of the Local Railway Stock Company of Munich.—Length, 106.71 kilometers; all in Bavaria.

Boizenburg City and Harbor Railway.—Length, 2.57 kilometers; all in Mecklenburg-Schwerin.

Brunswick Railway.—Length, 82.08 kilometers, of which 20.05 were in Prussia and 62.03 in Brunswick.

Bregthal Railway (Hüfingen and Hammereisenbach).—Length, 15.97 kilometers; all in Baden.

Degendorf and Metten Railway.—Length, 5.32 kilometers; all in Bavaria.

Eisenberg and Crossen Railway.—Length, 8.25 kilometers, of which 0.28 were in Prussia and 7.97 in Saxe-Meiningen.

Ermsthal Railway.—Length, 10.43 kilometers; all in Württemberg.

Gotteszell and Viehtach Railway.—Length, 24.97 kilometers; all in Bavaria.

Halberstadt and Blankenburg Railway.—Length, 55.08 kilometers, of which 31.16 were in Prussia and 23.92 in Brunswick.

Hohenebra and Ebeleben Railway.—Length, 8.70 kilometers; all in Schwarzburg-Sondershausen.

Ilmenau and Grossbreitenbach Railway.—Length, 19.13 kilometers, of which 2.04 were in Saxe-Weimar and 17.09 in Schwarzburg-Sondershausen.

Kirchheim Railway.—Length, 6.26 kilometers; all in Bavaria.

Mecklenburg Southern Railway.—Length, 116.46 kilometers, of which 107.82 were in Mecklenburg-Schwerin and 8.64 in Mecklenburg-Strelitz.

Neubrandenburg and Friedland Railway.—Length, 25.63 kilometers; all in Mecklenburg-Strelitz.

Neustrelitz, Wesenberg and Mirow Railway.—Length, 22.65 kilometers; all in Mecklenburg-Strelitz.

Osthofen and Westhofen Railway.—Length, 22.65 kilometers; all in Mecklenburg-Strelitz.

Parchim and Ludwigslust Railway.—Length, 25.87 kilometers; all in Mecklenburg-Schwerin.

Reinheim and Reichelsheim Railway.—Length, 17.94 kilometers; all in Hesse.

Ruhla Railway.—Length, 7.29 kilometers; of which 6.68 were in Saxe-Weimar and 0.61 in Saxe-Coburg-Gotha.

Schaftlach and Gmund Railway.—Length, 7.71 kilometers; all in Bavaria.

Sprendlingen and Wollstein Railway.—Length, 5.90 kilometers, all in Hesse.

Worms and Offenstein Railway.—Length, 10.93 kilometers; all in Hesse.

The entire length of the private railways under private management in Germany was 3,915.59 kilometers, of which 11.72 were in Alsace-Lorraine, 1,582.15 in Prussia, 814.82 in Bavaria, 17.69 in Wurtemberg, 42.93 in Baden, 547.32 in Hesse, 250.87 in Mecklenburg-Schwerin, 89.41 in Saxe-Weimar, 70.02 in Mecklenburg-Strelitz, 34.79 in Oldenburg, 85.95 in Brunswick, 139.34 in Saxe-Meiningen, 59.75 in Saxe-Altenburg, 65.38 in Saxe-Coburg-Gotha, 15.46 in Schwarzburg-Rudolstadt, 29.19 in Schwarzburg-Sondershausen, 15.04 in Reuss (new line), 40.02 in Lubeck, and 4.74 in Hamburg.

RAILROAD ADMINISTRATION.[1]

Railways in Germany are divided, with respect to their ownership and management, into three general classes, viz: (1) Imperial railroads, such as those of Alsace-Lorraine, which are owned and managed by the Imperial Government; (2) State railways—that is, roads and systems owned and managed by States like Prussia, Saxony, Bavaria, and

[1] Extracts reprinted from Consular Reports No. 170, November, 1894.

Wurtemberg, and (3) private railways, which includes the roads which were built and remain in the possession of incorporated companies, similar in all important respects to the railway companies of Great Britain and the United States.

STATE RAILWAYS.

Of these three groups, by far the most important in Germany is the second—the State railways—and of this foremost group the principal unit is formed by the State railways of Prussia, which include 25,633.57 kilometers (15,928 miles), or more than half of the 42,963.69 kilometers (26,847 miles) of railroads in operation within the German Empire at the close of 1893. As the Prussian system includes the great through lines between Berlin and Hamburg, Cologne, Frankfort, and Breslau, and, with one exception, all the important railroads which traverse the district of Frankfort, it is chosen as the principal subject of this report, the second portion of which is devoted to the Hessische Ludwig's Railway Company, as a prominent example of a railway system under corporate ownership and management.

The Prussian railways are owned and operated not as distinct individual lines, each having its specific termini, tariffs, and a special management controlling a single road as a separate unit, but as a consolidated system covering the whole territory of Prussia, which is divided for this purpose into eleven districts, each of which is managed by a president and a complete administration, including all the various bureaus of construction and supply, passenger and freight traffic, and all their subordinate departments in elaborate and complete detail. These eleven geographical districts divide the entire State railway system of Prussia into the same number of working sections or divisions, similar in many respects to the separate divisions of a transcontinental railway working under one central management in the United States. The districts have their headquarters, respectively, at Altona, Berlin, Breslau, Bromberg, Elberfeld, Erfurt, Frankfort, Hanover, Magdeburg, and two at Cologne, viz., one for the State railroads on the right bank and the other for the roads on the left bank of the Rhine.

The administration of each of these eleven divisions controls whatever part of the State railways which lie within the geographical limits of its district. The Hanover division has 2,306 kilometers (1,382 miles) of track; that of Frankfort, 1,335.94 kilometers (830 miles); and that of Berlin, 3,215 kilometers (1,998 miles), the least important being Elberfeld, with 1,246.12 kilometers (774 miles) of line. All the division administrations report to a central office in Berlin, where the statistics are collated and more or less completely published, and it is for this reason—the reports being from geographical divisions and not from complete and distinct roads, the whole Prussian railway system being treated in the records of a collective unit—that separate statistics of any individual line which runs through the territory of two or more

districts are not available. With this inevitable modification, the questions presented by the instructions of the Department may be answered as follows, values being given in United States currency and distances in kilometers:

The Prussian State railway system is under the control of the State Government of Prussia.

The total length of road operated is 25,633 kilometers (15,928 miles), of which 15,412.75 kilometers are single tracked, 9,967.92 kilometers are double tracked, 36.76 kilometers have triple tracks, and 41.22 kilometers have quadruple tracks.

The number of passengers carried was 324,530,111, as follows:

First class (0.4 per cent)	1,225,552
Second class (10.4 per cent)	33,835,279
Third class (51.2 per cent)	166,139,873
Fourth class (36.5 per cent)	118,330,873
Military	4,998,534
Total	324,530,111
Total number of tons of freight carried	147,699,422

The rates charged for transportation of passengers were as follows:

Description.	Per kilometer.	Per mile.	Description.	Per kilometer.	Per mile.
	Cents.	*Cents.*		*Cents.*	*Cents.*
First class	1.91	3.09	Fourth class	0.492	0.798
Second class	1.237	2.01	Military	.382	.619
Third class	.762	1.29			

Freight charges are classified under three special schedules or tariffs, numbered, respectively, I, II, and III. Each kind of merchandise is charged as freight according to the schedule to which it belongs, under the decision of the Deutscher Eisenbahn-Verband. Thus wheat and flour are rated as first-class freight; iron plates, machinery, etc., come under the second schedule; and pig iron and coal come under Schedule III. The cost per ton for a haul of 1 kilometer is the same for all three classes of freight, but as the distance carried increases, the second and third class schedules decline relatively in proportion to the length of haul until a ton of first-class freight carried 1,000 kilometers (621 miles) pays $10.99, while a ton of second-class freight carried the same distance costs $8.61, and a ton of third-class freight carried the same distance costs $5.52.

The following rates per ton for wheat, flour, pig iron, and coal carried 1, 30, 50, 100, and 500 kilometers, will illustrate the general working of the schedules:

Articles.	1 kilometer (0.6214 mile).	30 kilometers (18.64 miles).	50 kilometers (31.07 miles).	100 kilometers (62.14 miles).	500 kilometers (310.7 miles).
Wheat (first class)	$0.20	$0.54	$0.78	$1.29	$5.64
Flour (first class)	.20	.54	.78	1.29	5.64
Pig iron (third class)	.20	.47	.59½	.85	2.92
Coal (third class)	.20	.47	.59½	.85	2.92

PRIVATE RAILWAY CORPORATIONS.

In order to illustrate more completely the relative conditions of State and corporate railway management in the consular district of Frankfort, there is herewith presented the following exhibit of the Hessische Ludwig's Railway Company, a private corporation, organized in 1844, which built and still manages the system of railways which lies within the territory of the Grand Duchy of Hesse.

The central management of the company is located at Mayence, which is the geographical focus of the system, and its lines extend down along the left bank of the Rhine beyond Bingen, whence it is continued as an unbroken route by the Prussian State line to Cologne, eastward through Frankfort, Hanau, and Aschaffenburg to the Bavarian frontier, southward through Worms to Eberbach, and northward to Wiesbaden.

The capital stock of the company is 111,900,000 marks ($26,632,200), on which were paid dividends of 4⅔ per cent in 1890 and 1891, and 4¼ per cent in 1892. Its shares stand in the market to-day at 114 to 115. Like the Prussian State railways above described, the Hessische Ludwig's is a network or convergent system rather than an extended line, and includes twenty-eight different roads and branches, united under one ownership and management, and having an aggregate length of 699.72 kilometers (434.52 miles). The first portion of this system was opened for traffic in September, 1848, and its latest construction was finished in August, 1888. Applying to this corporation the inquiries presented by the Department circular of April 10, 1894, the exhibit is as follows:

(1) The Hessische Ludwig's Railway Company is a private railway corporation, similar in organization and management to railway companies in Great Britain and the United States.

(2) The central terminus is at Mayence, and the points touched are Frankfort, Hanau, Worms, Wisbaden, Alzey, Bischoffsheim, and Sachsenhausen.

(3) The total length of the line is 699.72 kilometers (434.52 miles). Distances between main points are: Mayence through Worms to Bavarian frontier, 47.25 kilometers; Mayence by Bingen to Prussian frontier, 30.58 kilometers; Mayence to Aschaffenburg, 76.21 kilometers; Mayence to Frankfort, 38 kilometers.

(4) The condition of the line is good. Bridges are of iron and stone, and the track is well ballasted and well kept. Stations are neat and in good repair. Locomotives and cars are mainly of old patterns, but are well kept and in serviceable condition.

(5) Double-tracked lines aggregate 371.53 kilometers (230.86 miles), and single-tracked lines 328.19 kilometers (203.94 miles).

(6) From Frankfort to Mayence and Bingen, there are thirteen daily passenger trains in each direction; from Frankfort via Hanau to Eber-

bach, seven daily trains each way. Smaller branch lines run five or six daily trains in winter and seven in summer.

(7) The rates for passengers are the same as those given above for the State railways of Prussia, and where the lines of the Hessische Ludwig's Company parallel those of Prussia, as, for example, from Frankfort to Bingen, on either bank of the Main and Rhine, passage tickets are interchangeable—that is, good over either line. Passenger rates per kilometer are: First class, 1.91 cents; second class, 1.237 cents: third class, 0.762 cent; fourth class, 0.492 cent; military, 0.382 cent (3.09, 2.01, 1.29, 0.798, and 0.619 cents per mile).

Freight rates are also identical with those given for the Prussian State railways. All freights are grouped, according to the nature of the merchandise, under three general classes, viz, first, second, and third class freights, and the charge for transportation in each class is in accordance with the distance carried, the price per ton per kilometer declining gradually and in mathematical ratio to the increased length of haul.

None of the lines of this company overcome any great natural obstacles. The principal bridge construction is that which spans the Rhine at Mayence.

FRANK H. MASON,
Consul-General.

FRANKFORT, *June 21, 1894.*

CANALS.[1]

A map issued by the Prussian minister for public works shows the German waterways and their capacity, viz:

(1) Friederich Wilhelm or Muellerse Canal, which unites the Oder and Spree, is 24 kilometers in length.

(2) Tinord Canal, which unites the Oder and Havel, is 48 kilometers in length.

(3) Plauer Canal, which unites the Havel and Elbe, is 35 kilometers in length.

(4) Ruppine Canal, which unites the Rhine and Havel, is 38 kilometers in length.

(5) Bromberger Canal, which unites the Oder and Weischel, is 28 kilometers in length.

These first canals have been and are still of the greatest importance to the Prussian Kingdom, and especially to the city of Berlin.

They connect nearly all the great rivers running through Prussia from south to north into the Baltic or North Sea.

The great progress made by Berlin during the past twenty years would have been quite impossible without these artificial waterways, as nearly all the building materials used in the extension of the city have been transported to Berlin through their agency.

---

[1]Reprinted from Special Consular Reports, "Canals and Irrigation."

The importance of Magdeburg as a center of the German sugar industry is likewise due to the facilities offered by these five canals for the cheap transportation of all sorts of bulky material.

All the canals in the Prussian Kingdom belong to the Government and are managed by the ministry of public works. They were constructed entirely for the benefit of the people, and have never been an object of speculation.

The traffic is immense; the rates of transportation very low.

The canals are administered with great care and with the best possible pecuniary advantage to the Government.

The gradually falling courses of the rivers of Prussia favor the construction and operation of canals. Some canals were constructed exclusively for the purpose of preventing inundations, whilst some others serve only for wood floating.

(6) The Elbing-Nogat Canal leads to the Frische-Haff, a part of the Baltic Sea.

(7) The Johannisburg Canal unites several lakes, the principal traffic being wood floating.

(8) Hamme-Oste Canal unites the Elbe and Weser.

(9) Hunte-Ems Canal unites the Weser and Ems.

(10) Jade Canal unites the North Sea and Ems.

(11) Ems-Rhin Canal unites the Rhine and Ems.

(12) Hadamar Canal unites the Elbe and Weser.

(13) Eider Canal, near Kiel, leads from the Baltic to the North Sea; is 48 kilometers in length, 11 feet deep, and 96 feet broad on the surface.

(14) The Ludwigs Canal in Bavaria is very important, uniting the Donau, the Maia, and the Rhine. It is 188 kilometers in length, 5 to 6 feet in depth, 54 feet breadth on the surface, and 34 feet at the bottom.

(15) Alsace-Lorraine-Rhine-Rhone Canal leads from the Rhine near Strasburg to the Rhone in France.

(16) Rhine-Marne Canal leads from the Rhine near Strasburg to the Marne in France.

(17) Saar Canal leads from Saarburg to Saargemund.

The testimony is unanimous that all these canals have been worked for the benefit of the people, and have aided materially in advancing the commercial prosperity of the country.

W. H. EDWARDS,
Consul-General.

BERLIN, *October 9, 1889.*

ALSACE-LORRAINE.[1]

The canal system of Alsace-Lorraine consists of six main canals, with several branch canals. The main canals are:

(1) The Rhine-Rhone Canal, from the French frontier to Mulhausen and thence to Strasburg.

---

[1] Extract from report of Consul Johnson, of Kiel, September 21, 1889, published in "Canals and Irrigation."

(2) The Strasburg Canal system.

(3) The Breush Canal, from Goolsheim to Strasburg.

(4) The Rhine-Marne Canal, from the French frontier to Saarburg, Fabern, Pfalzburg, Hochfelden, Brumath to Strasburg.

(5) The Saar Coal Canal, from the Rhine-Marne Canal, near Gondersingen, to Saarbrucken.

(6) The Moselle Canal, from the Rhine-Marne Canal to Metz, with branches.

The number of boats frequenting the canals of Alsace-Lorraine is about 1,500, manned by about 4,000 persons. The size and carrying capacity of the canal boats are different, according to their purpose and according to the mode of building which is customary where they are constructed.

BALTIC AND NORTH SEA CANAL.[1]

In view of the opening of the Baltic and North Sea Canal on the 20th of June, the description of the canal by Consul Johnson, of Hamburg, published in Consular Reports No. 129 (June, 1891), page 209, is of special interest at this time. The legislation for connecting the Baltic with the North Sea was enacted in 1886. The first spadeful of earth inaugurating the work was turned by Emperor William I at Holtenau, near Kiel, on the 3d of June, 1887. The canal is 98.6 kilometers (61.27 miles) in length. It begins at Holtenau, on the Bay of Kiel, and terminates near Brunsbuttel, at the mouth of the River Elbe, thus running clear through the province of Schleswig-Holstein from northeast to southwest. Both openings are provided with huge locks. Near Rendsburg there is a third lock connecting the canal with the old Eider Canal. The medium water level of the canal will be about equal to the medium water level of Kiel Harbor. At the lowest tide the profile of the canal has, in a depth of 6.17 meters (20 feet 6 inches) below the surface of the water, a navigable width of 36 meters (118.11 feet), so as to allow the largest Baltic steamers to pass each other. For the navy, 22 meters (72.18 feet) of canal bottom are provided, at least 58 meters (190.29 feet) of water surface, and 8½ meters (27 feet 9 inches) depth of water. The greatest depth for merchant vessels was calculated at 6.5 meters (21 feet 3 inches). The estimated cost was $37,128,000. Two-thirds of the cost is defrayed by the German Empire; the remaining one-third by Prussia. The time saved by a steamship sailing from Kiel to Hamburg via the canal, instead of through the Skaugh (the strait between Jutland and Sweden), is estimated at two and one-half days. The time of passage through the canal, including stoppages and delays, will be about thirteen hours. In time of peace the canal is to be open to men-of-war as well as merchant vessels of every nation, but in time of war its use will be restricted to vessels of the German navy. Many vessels have been

[1] Reprinted from Consular Reports No. 175, April, 1895, pp. 603, 604.

wrecked and many lives lost on the Danish and Swedish coasts, in waters which need not be navigated after the canal is opened to traffic. Its strategic importance to Germany will also be great, as it will place that country's two naval ports, Kiel on the Baltic and Wilhelmshafen on the North Sea, within easy access of each other.

HIGHWAYS.[1]

The excellent roads of Germany are mainly a heritage from the century which immediately preceded the introduction of railroads. In those days the mails and the few travelers who journeyed by public conveyance were carried by post chaises; freight was transported by great, lumbering wagons, each drawn by six horses, and, what was regarded as not less important in that period of prolonged and incessant warfare, broad, smooth roads were necessary for the rapid movement of the king's armies with their supply trains and artillery. Accordingly the construction and maintenance of public highways was then an important function of the national Government, administered by a vast bureau or department similar to the department of Ponts et Chaussees now maintained in France. It required many years after the introduction of railroads to persuade the conservative officials of the Prussian Government that the period of freight wagons and post chaises was forever past, and that thenceforth their splendid system of macadamized and graded highways must play a secondary rôle. The lesson was finally learned, however, and on the organization of the empire, in 1870, or soon thereafter, the state assumed control of the principal railways and turned the public roads back to the care of the provinces. The consequence is that Baden, Wurtemberg, Bavaria, Westphalia, and the other provinces of Germany have each their separate system of administration for the construction and maintenance of public roads.

As a result of the circumstances already noticed, very few new roads are now constructed in this part of Germany. The great national roads which were built before the railway period are adequate for all military purposes. The principal work of later years has been to improve suburban highways and secure easy communication at all seasons between important railway stations and the surrounding districts. For this purpose narrower and cheaper roads than those formerly built are frequently adequate, so that it may be said in general that the standard of road building has deteriorated during the last twenty years in all parts of Germany, except Baden, where the highest grade of excellence is still maintained. In respect to construction, the German process is identical with that of France and Switzerland. Every

[1] Extract from report of Consul-General Mason, of Frankfort on the Main, February 13, 1891, printed in Special Consular Reports, "Streets and Highways."

important road is a graded, macadamized turnpike, with culverts of massive stone, ditches on either side (which are paved wherever there is danger of washing), and generally lined with trees (either poplar, sycamore, or linden). All slopes and counterscarps are secured by grass, planted from seed when the soil is sufficiently fertile to receive it, otherwise by turfing. Where the slope is necessarily steep and unstable, it is faced, like the retaining walls of embankments, with solid masonry.

The profile and alignment of each road is a skillful compromise between directness of route and an easy gradient. Wherever practicable, the road is a straight line between the points connected; when the exigencies of surface forbid this, the best skill of the engineer is employed to circumvent the obstacle by the most direct route compatible with a practicable grade. Bridges were formerly exclusively of masonry, but of late years iron and steel structures of various patterns similar to those used in the United States for railway and road bridges have been introduced. Wherever a German road is flanked by a slope or precipice which presents the slightest danger. the exposed side is guarded by a line of heavy stone posts, connected wherever necessary by railings of iron or wood, and in many places these pillars are of white basalt, which renders them more easily distinguishable at night.

FRANKFORT ON THE MAIN.

There are no canals of any consequence in this district, and but one important canalized river, the lower Main, which has been improved by dams, locks, and dredging operations so as to enable freight boats from the Rhine to ascend the river to Frankfort, a distance of 20 miles. The highways of commerce in this district include, therefore, the canalized River Main and the railways, which are numerous and important, Frankfort being one of the most important railway centers in southern Germany.

Railways.—The great through lines of railways converging at this point belong mainly to the State railway system of Prussia, and are owned and managed by the State as a collective branch of the public service, divided into eleven districts or geographical divisions, each managed by a complete and distinct administration, subordinate to the central bureau of direction at Berlin. The headquarters of these districts, which comprise collectively the entire territory of Prussia, are at Frankfort, Cologne, Magdeburg, Hanover, Breslau, Bramberg, Elberfeld, Erfurt, Altona, and Berlin, respectively, and the records of each separate divisional administration cover every detail of the cost, earnings, expenses, etc., of each mile of State railway within the geographical limits of that district. Each through line from Frankfort to Berlin, Hamburg, or other important German city passes, therefore, through two or more divisions, and is in respect to its management

and statistics under as many different although similar and closely associated administrations. The principal through lines radiating from Frankfort include two between this city and Berlin, one to Hamburg and Bremen, two down the Rhine to Cologne, one via Mannheim and Strasburg to Switzerland, one via Darmstadt, Heidelberg, Karlsruhe, and Freiburg to Basel, and one eastward to Wurzburg, Nuremberg, and Munich.

(1) The most direct line from Frankfort to Berlin is that via Hanau, Bebra, Erfurt, Halle, and Wittenberg. It is 334 miles in length, and traverses the railway divisions or districts of Frankfort, Erfurt, Magdeburg, and Berlin. The distances between main points are: Frankfort to Bebra, 103 miles; Bebra to Halle, 131 miles; Halle to Berlin, 100 miles. The road is double tracked throughout, and like all the Prussian State railways, is maintained in excellent condition. There are seven daily through trains in either direction, of which five are express (schnellzüge), and make the run in from ten to ten and a half hours. In summer this time is reduced by two of the trains to nine hours. Modern vestibule trains, with sleeping and day cars of improved types, are run on this and the other leading through routes of Germany.

(2) The second route from Frankfort to Berlin is via Marburg to Cassel, and thence via Halle or Magdeburg to the capital. It is 378 miles in length via Magdeburg; 358 miles via Halle, and the time of through express trains varies from ten to eleven hours. There are six daily trains, of which four are express, the others being of the class known in the United States as "accommodation," which stop at all regular stations.

(3) The route from Frankfort via Hanover to Hamburg and Bremen is the same as the foregoing as far as Cassel, 124 miles. At Cassel the Berlin section of the train is detached, and the remainder continues its run to Hanover, where it is again divided, one section going to Hamburg, the other to Bremen. The entire distance from Frankfort to Hamburg is 338.64 miles; Frankfort to Bremen, 300 miles, and the through express time is from nine and a half to ten hours. There are seven daily through trains, of which four are express, and the sleeping cars on this route are among the best in Germany.

(4) There are two parallel railway routes from Frankfort to Cologne, one traversing each bank of the Main and Rhine. The line on the right bank belongs wholly to the Prussian State system, and passes through Kastel, Rudesheim, Niederlahnstein, and crosses the Rhine at Cologne. The route on the left bank belongs, from Frankfort through Mayence and as far as Bingen, to the Hessische Ludwig's Railway Company, a corporation which controls the railway lines within the territory of the Province of Hesse-Darmstadt, and from Bingen to Cologne it is part of the Prussian system, which has two administrative offices at Cologne, one for the railways on the right, the other for those on the left of the river. The distances are: From Frankfort to Mayence, 20 miles; Mayence to Coblenz, 59 miles; Coblenz to Cologne, 67.7

miles; total, Frankfort to Cologne, 136.7 miles. There are eight daily trains by either route, four of which, on each line, are express, and make the run in about four hours. Tickets either direct or return, are good indiscriminately over either line for all or any part of the distance.

(5) The principal railway route southward from Frankfort is that via Darmstadt, Heidelberg, and Carlsruhe to Basel, on the Swiss frontier whence it is continued by the Central and Jura Swiss lines to Geneva, and via Lucerne, over the St. Gothard route to Italy. The distances are: From Frankfort to Heidelberg, 54.68 miles; Heidelberg to Carlsrhue, 34.17 miles; and from Carlsrhue to Basel, 122.41; total, 211.26 miles. There are six daily through trains, of which four are express, and make the run in from six to six one-half hours. This line belongs, as far as the frontier of Baden, near Heidelberg, to the Hessische Ludwig's Company; thence to Basel, it is a State railway of Baden, built and controlled by the provincial government.

(6) Eastward route from Frankfort to Aschaffenburg, Wurzburg, Nuremberg, and Passau, toward Vienna. This route lies mainly within the territory of Bavaria, and forms part of the Royal Bavarian Railway system. There are eight daily trains from Frankfort to Wurzburg, where the line divides, one branch continuing due eastward through Nuremberg and Passau, where it connects with the Austrian line for Vienna, and the other turning southward to Munich. The distances are: Frankfort to Aschaffenburg, 26 miles; Aschaffenburg to Wurzburg, 55.9 miles; Wurzburg to Nuremberg, 64 miles; Wurzburg to Munich, 124 miles.

All the above lines are double tracked throughout and are of uniform standard gauge. Passenger fares are uniform throughout the entire Prussian State system, and are as follows: First class, 3.09 cents per mile; second class, 2.01 cents per mile; third class, 1.29 cents per mile. These rates are charged in each class for every mile traveled, no discrimination being made in favor of a long as compared with a short trip. The one important concession which is offered is the uniform discount of 25 per cent in the price of return tickets as compared with the cost of two single direct fares over the same route and distance. Thus, if a single direct ticket between two points costs, say, $10, a return ticket for the round trip would be sold for $15, that is, $20, less 25 per cent of that sum. Second-class and even third-class cars are run on most of the express trains, and it is generally conceded that second-class accommodations in Germany are better than in any other European country,

All passenger cars, whatever the class, are lighted with gas and warmed in winter by steam from the locomotive. The car stove is no longer used in Germany except upon small and unimportant local lines.

Railway freight charges are classified under three special schedules or tariffs, numbered respectively, I, II, and III. Each kind of mer-

chandise is charged as freight according to the schedule to which it belongs, under the decision of the German Railway Union, which issues a list in which each kind of goods or material likely to be transported by rail is placed in one of the three schedules above indicated. Thus, wheat and flour are rated as first-class freight; iron plates, machinery, etc., come in the second class, and coal, pig iron, etc., are freights of the third class. The cost per ton for a haul of 1 kilometer is the same in all three classes, but as the distance increases the second and third class freights decline relatively in proportion to the length of haul, so that while a ton of first-class freight carried 1,000 kilometers (621 miles) costs $10.99, a ton of second class freight carried the same distance costs $8.61 and a ton of third-class freight, $5.52. Thus, while a ton of wheat and a ton of coal, representing, respectively, the first and third classes of freights, would each cost 20 cents for the first kilometer, the charges on a ton of wheat for a haul of 500 kilometers (310.7 miles) would be $5.64, while the ton of coal would be carried the same distance for $2.92.

The canalized River Main.—As has already been stated, this is the only water route which reaches the city of Frankfort. From Frankfort to Mayence, where the Main flows into the Rhine, the former river was naturally a sluggish stream, about 200 feet in average width, and obstructed by gentle rapids and shallow places which seriously impeded navigation at ordinary or low stages of water. In order to surmount this difficulty and bring Frankfort into practical connection with the navigable Rhine, the lower Main was canalized; that is, its channel was deepened and provided with dams and locks to permit the passage of boats of the Rhine class at ordinary stages of water. The work was begun in 1883, and was finished and opened in October, 1886, at a cost of $1,309,500. There are four dams with side canals and locks at different points along the 20 miles of river, the locks being 285 feet in length by 35 feet in width, and they secure at low water a minimum depth of 8 feet. The craft which navigate this important water route are mainly the iron freight boats of the Rhine, which are decked barges, with one or two short masts from which sails are spread before a favorable wind, but which depend, when in the Main, upon being towed by small tugs. They bring coal, grain, building materials, and other coarse freights from the lower Rhine, and are largely used for most kinds of export freights which go via Rotterdam and Antwerp.

Rates of transport by this route are as follows:

(1) Downstream: Frankfort to Mayence (20 miles), 6 cents per 100 kilograms (224 pounds); Frankfort to Cologne (126 miles), 12 cents; Frankfort to Rotterdam, 14 to 15 cents per 100 kilograms.

(2) Upstream: Cologne to Mayence, 18.5 cents; Mayence to Frankfort, 7.5 cents; Rotterdam to Frankfort, 34 cents per 100 kilograms.

This is therefore by far the cheapest and most advantageous route for the shipment of heavy freights between Frankfort and the seaboard

Highways.—The public highways throughout Germany are macadamized roads, carefully graded, solidly built, and maintained at Government expense in admirable condition. The construction of most of these highways dates from the period preceding the introduction of railways. Having been carefully and thoroughly built, and being now comparatively little used for heavy hauling over long distances, they are kept in repair at a comparatively trifling cost. They are of three classes, varying from 22.9 to 26.47 feet in width; the slopes of embankments and excavations are turfed and the roadsides are usually lined with poplar, walnut, or fruit trees. In remote country districts, where railways have not yet penetrated, mails and passengers are still carried by diligence, but in this portion of Germany the railways have entirely usurped this function, and there is no longer in this region any highway which serves an important purpose for through travel or traffic.

FRANK H. MASON,
Consul-General.

FRANKFORT, *February 28, 1895.*

LUXEMBURG.

The principal railway lines of the Grand Duchy of Luxemburg are operated and controlled by the German Government (Alsace-Lorraine division). Prior to the conclusion of the Franco-German treaty of May 10, 1871, these lines were controlled by the French Eastern Railway Company. By the Luxemburg-German treaty of June 11, 1872, the control of these lines was ceded to the German Government for the term of years ending December 31, 1912. In article 2 of the treaty, the German Government obligated itself never to use these railway lines for the transportation of troops, weapons, materials of war, or munitions, or otherwise to violate the neutrality of the Grand Duchy.

All the lines which center at the city of Luxemburg are under German control.

The Prince Henri Railway is operated by a private company. Its importance is chiefly local, and therefore it does not appear necessary to allude further to its lines in this report.

In addition to these two important railway systems, there are in the Grand Duchy of Luxemburg two cantonal and two secondary railway lines.

The lines controlled by the Alsace-Lorraine State Railway Department are:

(1) Luxemburg-Ettelbruck-Ulflingen, connecting at Ulflingen with the Belgian road, via Spa, to Verviers, and the German road, via St. Vith, to Aix la Chapelle.

(2) Luxemburg-Wasserbillig, connecting at Wasserbillig with the German road, via Trier, to Coblenz.

(3) Luxemburg-Bettemburg (direct line to Metz and Strasburg).

(4) Bettemburg-Esch, connecting at Esch with the Prince Henri road, via Petingen, to Longwy, in France (direct line from Luxemburg to Paris, via Sedan and Rheims).

(5) Longwy-Bettingen, connecting at Bettingen with the Belgian road, via Arlon, to Brussels.

All of these lines have double tracks with exception of the first mentioned, which has a single track, and all are in good condition, but the rolling stock in use does not seem to be as modern as that now used on the great through lines in Germany.

Owing to the smallness of the country, and the absence of important cities, it is useless to discuss in this report local freight rates. The German tariff of through freight rates applies to Luxemburg. As, however, Antwerp is the natural seaport for the Grand Duchy of Luxemburg, and as Luxemburg lies only 11 miles from the Belgian frontier, the Belgian freight tariff is the one which exercises the chief influence upon American commercial relations with the Grand Duchy of Luxemburg. The tables hereto attached give full details in regard to the frequency of communication on each line, distances, speed, and passenger rates.

The William-Luxemburg Railway, operated by the German Alsace-Lorraine State Railway Department.

From Luxemburg to the frontier or terminal station at—	Trains daily.		Time (slow trains).	Distance.	Speed per hour (slow trains).	Passenger rates. *a*			Average passenger rates per mile.		
	Slow.	Express.				First class.	Second class.	Third class.	First class.	Second class.	Third class.
			Hours.	*Miles.*	*Miles.*				*Cents.*	*Cents.*	*Cents.*
Ulflingen	4	.....	2¼–2½	42.8	17–19	$1.35	$0.90	$0.58			
Diekirch	5	.....	1¼	21.5	17	.67½	.46	.29			
Wasserbillig	5	.....	1	22.8	22	.72	.47	.32			
Bettemburg	9	.....	⅓– ½	7.1	14–21	.24	.15	.11	3¼	2½	1½
Esch	6	.....	¾–1	13	13–17	.43	.29	.18			
Bettingen	6	2	*b* ½	11	*c*22	.37	.24	.15			

a Rates for the faster trains are a little higher. The prices of round or return tickets (good for ten days) are: First class—Price of one single first-class ticket plus price of one single third-class ticket. Second class—Price of one single first-class ticket. Third class—Price of one single second-class ticket.

b Express trains, 20 minutes.

c Express trains, 33 miles per hour.

Cantonal railways.

Termini.	Number of trains daily.	Time.	Distance.	Speed per hour.	Passenger rates. *a*		Average passenger rates per mile.	
					Second class.	Third class.	Second class.	Third class.
		Minutes.	*Miles.*	*Miles.*			*Cents.*	*Cents.*
Diekirch-Vianden *b*	6	52	8.5	9¾	$0.27	$0.16	3¼	2
		Hours.						
Nordingen-Martelange	3	1¾–2	18.3	9–10⅓	.58	.35		

a Prices of return tickets—Diekirch-Vianden: Second class, 43 cents; third class, 27 cents. Nordingen-Martelange—Second class, 93 cents; third class, 58 cents.

b Narrow-gauge road.

Secondary railways (narrow gauge).

Termini.	Number of trains daily.	Time.	Distance.	Speed per hour.	Passenger rates. *a*		Average passenger rates per mile.	
					Second class.	Third class.	Second class.	Third class.
		Hours.	*Miles.*	*Miles.*			*Cents.*	*Cents.*
Luxemburg-Remich	4	1¾	16.9	9½	$0.39	$0.24	2⅓	1½
Cruchten-Fels	5	⅔	7.5	11	.20	.12½	2⅔	1⅔

a Prices of return tickets: Luxemburg-Remich—Second-class, 58 cents; third class, 39 cents. Cruchten-Fels—Second class, 31 cents; third class, 20 cents.

Prince Henri Railway. (No express trains.)

Line.	Trains daily.	Time.	Distance.	Speed per hour.
		Hours.	*Miles.*	*Miles.*
Esch-Petingen	5	½	10	20
Petingen-Ettelbruck	4	2½–3	33	11–13
Diekirch-Grevenmacher	5	2 –3	34	11–17
Kautenbach-Schimpach	3	¾–1	12	12–16

Passenger rates from the city of Luxemburg to important stations of the Prince Henri Railway.

Station.	First class.	Second class.	Third class.
Petingen	$0.67½	$0.48	$0.32
Bettingen	.37	.24	.15
Nordingen	.77	.58	.37
Wiltz	1.14	.80	.51
Echternach	1.09	.77	.51
Grevenmacher	.77	.53	.34

The prices of round trip or return tickets (good for ten days) are: First class, price of one single first-class ticket, plus price of one single third-class ticket; second class, price of one single first-class ticket; third class, price of one single second-class ticket.

The total mileage of the various railway lines in the Grand Duchy of Luxemburg is as follows:

William-Luxemburg	116
Prince Henri	104
Cantonal lines	27
Secondary lines	25
Total	272

The area of the Grand Duchy of Luxemburg is almost exactly 1,000 square miles. It has, therefore, 1 mile of railway for every 4 square miles of area.

Passenger rates from the city of Luxemburg to important points in other countries.

To—	Distance.	Single tickets. *a*			Round trip or return tickets.			
		First class.	Second class.	Third class.	Number of days good.	First class.	Second class.	Third class.
	Miles.							
Antwerp	168	$4.97	$3.71	.....	4	$7.86	$5.87	$3.89
Basle	227	8.09	5.70	$4.03	3	10.11	7.28	4.71
Berlin	486	17.22	12.81	8.97	10	25.52	18.91	13.25
Brussels	140	4.27	3.18	.....	4	6.72	5.02	2.70
Cologne	159	5.26	3.79	2.65	4	7.43	5.50	3.79
Frankfort	181	7.07	4.63	3.21	.....	.....	.....	.....
Liege	101	3.43	2.56	.....	3	4.34	3.23	2.17
Metz	41	1.49	1.05	.....	3	1.86	1.30	.87
Paris	245	8.42	5.70	3.72	6	12.60	9.03	5.93
Strasburg	140	4.98	3.50	.....	3	6.33	4.37	2.90

a Prices quoted for fast trains.

Highways.—In addition to its railway network, the Grand Duchy of Luxemburg has another system of traffic channels in its excellent highways, which radiate from the capital town. These highways are of the best class, well constructed, straight, about 40 feet in width, in most cases bordered on each side by rows of trees. which are high and well trimmed. Some of these highways are of Roman origin.

Regular lines of diligences connect the villages and towns which do not enjoy the facilities of railway communication. Though it is, in area, considerably smaller than the State of Rhode Island, the Grand Duchy of Luxemburg has forty-four of these diligence lines. No other country in the world equals Luxemburg in the completeness of its systems of inland communication and intercourse. Every village and isolated house in the country can be conveniently and cheaply reached from the capital town by railway or by diligence, and in each individual case the journey can be begun and finished between sunrise and sunset.

Telegraphs and telephones.—Furthermore, the telephone and telegraph networks are so complete that from the central post-office in the town of Luxemburg it is possible to communicate in either way with persons in any village or hamlet in the country. Many isolated houses in remote districts are, in like manner, connected by telephone with the capital.

GEORGE H. MURPHY,
Vice Commercial Agent.

LUXEMBURG, *June 9, 1894.*

SWITZERLAND.

The consular district of Switzerland to which I am accredited comprises the Cantons of St. Gall, Graubunden, Thurgau, and Appenzell. The means of communication throughout these cantons consist of railways, wagon roads, and lines of steamers on Lake Constance.

RAILWAYS.

Two lines of road traverse the Cantons of St. Gall, Granbunden, Thurgau, and Appenzell, viz, the Northeastern line and the United Swiss line. Both are owned by private stock companies, but are regulated by the Federal Government.

Northeastern line.—The termini and main points of the Northeastern line,[1] together with distances in miles, are given in the following table:

Isliken (Thurgau boundary station) to Romanshorn	28.88
Rorschach to Constance	22.46
Constance to Etzweilen	19.55
Eminshofen to Kreuzlingen	0.73
Sulgen to Gossau	14.71
Total	86.33

The condition of the Northeastern line is perhaps best shown by the items of the table which follows:

Cost of roadbed	per mile	$66,225.35
Value of rolling stock	do	11,022.80
Value of furnitures and fixtures	do	1,159.12
Total		78,407.27

The line carried in the year 1892 (the most recent year for which figures have been obtainable) 8,366,047 persons. Of these, 67,358 were first-class passengers; 1,111,462 second-class, and 7,187,227 third-class. The total income of the road in 1892 was as follows: From passengers, $1,664,699.97; from freight, $2,116,153.70. The total cost of administration for the same time was $555,837.49, which is equivalent to $6,438.52 per mile.

United Swiss line.—In the case of the United Swiss road,[2] the termini and main points, together with distances, in miles, are given in the following table:

Aadorf (Thurgau boundary station), Rorschach	35.95
Rorschach-Sargans-Chur	57
Sargans-Rapperswil	36.86
Total	129.81

[1] Track is single and of normal width (1.435 meters = 4.7 feet).

[2] The line is single track and of normal width (1.435 meters = 4.7 feet).

The condition of this line is shown by the following statement:

Cost of roadbed	per mile..	$74,603.15
Value of rolling stock	do....	12,336.33
Value of furnitures and fixtures	do....	1,647.09

The line carried in the year 1892, 4,266,994 persons, of which 29,677 were first-class passengers; 497,551 second-class, and 3,739,766 third-class. The total income of the road in 1892 was: From passengers, $714,287.60; from freight, $844,841.87. The total cost of administration for the same time was $243,865.34, which is equivalent to $1,875.80 per mile.

Speed and accommodation.—The maximum speed attained on both lines—the Northeastern and the United Swiss roads—is 60 to 75 kilometers (37½ to 46½ miles) per hour. The cars are plain, but comfortable, and divided into two compartments, a large one for smokers and a small one for nonsmokers. Not all coaches are provided with first-class compartments. The entrances to coaches are by platforms at the ends, as in the United States. The seats are broad and low, upholstered in cloth, and the aisles narrow. The windows are raised and lowered by leather straps. In winter heat is supplied by steam pipes, and a lever for regulating the heat is a feature of each coach. Water-closets, as a rule, are found only in the baggage car.

Passenger rates per mile.

Class.	Northeastern line.		United Swiss line.	
	Single fare.	Round trip.	Single fare.	Round trip.
	Cents.	*Cents.*	*Cents.*	*Cents.*
First	3.06	2.14	3.06	2.57
Second	2.14	1.61	2.14	1.85
Third	1.61	1.20	1.61	1.29

Freight rates.—The charges for express freight, so called, are the same on both the Northeastern and United Swiss roads, namely, 70 cents for 1,000 kilos (2,204 pounds), and an additional charge of 6½ cents per 1,000 kilos for shipping expenses. The charges for common freight are also the same on both the above-named roads, namely, 39 cents per 1,000 kilos, and an additional charge of 3¼ cents per 1,000 kilos for shipping expenses.

The charges for freight per carload by the Northeastern road are $2.42 per 5,000 kilos (11,023 pounds), and for amounts greater than 5,000 kilos, $2.12 per 5,000 kilos.

In the case of the United Swiss road, the charges for freight by the car load are $2.60 per 5,000 kilos (11,023 pounds), and for greater amounts than 5,000 kilos, $2.42 per 5,000 kilos. To the above charges there is an addition for shipping expenses of 29 cents per 1,000 kilos.

Rates for long and short hauls in Switzerland are alike.

Neither the Northeastern nor the United Swiss road is characterized by any structures or engineering feats of a noteworthy character. The difficulties overcome were not formidable.

HIGHWAYS.

As constituting the most important of the ordinary highways in this consular district, the post-roads are mentioned. These roads are from 15 to 20 feet in width and are of excellent construction. Their foundation consists of round stones, and their surfaces are made hard and smooth with gravel.

In the case of a limited number of post-roads in Switzerland, the Federal Government exercises control and gives a subsidy towards their maintenance.

The following table gives the post-routes in the four Cantons:

Canton.	Post-roads.	Number of passengers.	Expenses for passengers and luggage.	Receipts from passengers and luggage.
	Miles.			
Appenzell	36½	13,057	$8,012.37	$2,422.38
Graubunden	455¼	104,874	220,911.03	119,627.78
St. Gall	119	60,666	34,498.43	14,336.38
Thurgau	67½	16,796	9,270.80	2,781.13
Total	678¼	195,393	272,693.63	139,167.67

Passenger rates by post conveyance are 3.2 to 4.9 cents per mile for inside accommodation, and 4.7 to 6.44 cents per mile for coupé or banquette. Return tickets, good for three days, are sold at a discount of 10 per cent. Alpine routes command higher prices, i. e., 8 cents for inside accommodation and 9.7 cents for coupé or banquette. Each passenger may take with him 30 pounds of luggage free of charge.

LAKE NAVIGATION.

Steamboat lines on Lake Constance.—These lines belong to the Northeastern Railway Company, which has an office of control at Romanshorn. The courses run by the steamers and the distances between the stopping points are:

From—	To—	Miles.	From—	To—	Miles.
Romanshorn	Arbon	5	Romanshorn	Bregenz	17⅕
Arbon	Rorschach	3⅗	Romanshorn	Friedrichshafen	7⅕
Rorschach	Lindau	10⅖			
Lindau	Bregenz	3⅗	Total		61⅕
Romanshorn	Lindau	14⅕			

Steamers running on the lake.

Name.	Boilers.	Horse-power.	Name.	Boilers.	Horse-power.
Helvetia	2	500	Säntis	2	400
Zürich	2	350	Thurgau	2	350
Bodan	2	250	St. Gallen	1	200

The average speed of the steamers is about 12⅖ miles per hour. The vessels themselves are well built and fitted out. In the year 1893 they carried 114,423 passengers, 281 tons of baggage, 6,647 head of

live stock, and 150,874 tons of freight. The average expenses for the year 1893 were 3,533 francs per kilometer ($1,087.51 per mile). Transportation rates per mile on these steamers are:

Passengers.—Single fare, first and second class, 3.4 cents and 2.08 cents; round trip, 4.9 cents and 3.2 cents. Baggage, 2.4 cents per 220 pounds.

Live stock.—Horses and mules, 8 cents per head; oxen and cows, 6.44 cents; heifers, asses, and colts, 3.4 cents; hogs, 2.08 cents; calves, sheep, and goats, 1.2; dogs, accompanying owners, one-half cent.

Freight rates.—The freight rates are: Express freight from Romanshorn-Bregenz, 18 cents per 220 pounds. The charges are the same between any other points on the lake. Common freight, by quantity or car load, is carried for 3 to 9 cents, according to class and distance, per 100 kilos (220 pounds).

IRVING B. RICHMAN,
Consul-General.

ST. GALL, *November 18, 1894.*

AUSTRIA-HUNGARY.

AUSTRIA.

The principal railroad lines of Austria lead to Vienna. They are all included in this report except the Nord West Bahn, which has been reported upon by the consul at Prague, and the lines to Budapest, which cross the Hungarian frontier a short distance from Vienna.

The only important ocean lines of this country are the Austrian Lloyds and the Hungarian Company (Adria).

The Danube Steamship Company has so many special tariffs, depending on the amount of freight and various other special conditions, that no clear idea thereof could be conveyed, without tables too numerous and complicated for this report.

The railroads, steamship companies, and highways of Austria are under the control or closely supervised by the Government. Although the tendency in Austria is to be somewhat conservative, as regards the adoption of new ideas, the public ways of communication are, on the whole, ably and economically managed. Travel is not as rapid as in the United States, but on the other hand there are fewer accidents. The Government is held more or less responsible by public opinion for the accidents that occur, and as labor is very cheap it is not surprising that the railroads are carefully built and closely watched. Where the more frequented highways are crossed by railroads, the tracks are, as a rule, either above or below the level of the road.

NAVIGABLE RIVERS AND CANALS.

The Danube, with its tributaries and canals, is the only important means of communication by river in Austria and Hungary. Its traffic

is controlled by the K. k. Privat-Donau-Dampfschiffahrt-Gesellschaft, a private company receiving a subvention from the Imperial Government of $100,000 yearly. Its vessels ply from Regensberg, Bavaria, the head of navigation on the Danube, to Sulina, on the Black Sea, on the various arms into which the river divides before emptying into the sea; and on the Vienna, Danube, Bjelina, Georges, Borca, and Gura-Balja canals, a total distance of 2,775 kilometers (1,417 miles); also, on the River Drau from the town of Barcs to its mouth, a distance of 151 kilometers (94 miles); on the Theiss, from the town of Csega to its mouth, a distance of 489 kilometers (285 miles); on the Franz-Joseph Canal, a distance of 187 kilometers (116 miles); on the Bega Canal, 115 kilometers (71 miles); on the Save from Goldova to its mouth, and on the tributaries of the Save, together a distance of 686 kilometers (426 miles); on the Black Sea from Sulina to Odessa, and from Sulina to Batoum. The total distance traversed by the various lines of this company is 5,637 kilometers (3,563 miles).

The most important stations on the Danube are Regensburg, Passau, Linz, Vienna, Pressburg, Budapest, Belgrade, and Orsova.

At the commencement of the year 1893 the company owned 156 side-wheel steamers of 15,131 horsepower, 25 propellers of 872 horsepower, and 766 iron boats with a tonnage of 2,805,624.

There is daily communication between Vienna and Passau, a steamer leaving each city every morning.

There is also a daily boat between Vienna and Orsova and Orsova and Vienna, and between Vienna and Pressburg. These vessels, which carry passengers, stop at all the small stations on the route. Besides the regular passenger steamers, there are numerous freight steamers running irregularly.

The fare, first class, from Vienna to Passau is $1.60, and downstream from Passau to Vienna $2.68. The fares to the most important places between Vienna and Orsova are:

Ports.	Up.	Down.	Ports.	Up.	Down.
Vienna to Pressburg	$0.72	$1.80	Belgrade to Orsova	$1.84	$4.60
Pressburg to Budapest	1.48	3.70	Vienna to Orsova	6.28	15.70
Budapest to Belgrade	2.24	5.60			

In the year 1892 the total receipts of the company were $4,157,946, and its net profits were $240,530.

The Elbe is only navigable for a short distance in Austria, but is of importance to American merchants, as one of the cheapest ways to send freight to Austria is to ship to Hamburg and then send the goods by the Elbe to Bohemia.

RAILWAYS.

The K. k. Südbahn-Gesellschaft.—The Südbahn Railway is controlled by a private company which received its first concession from the Government in the year 1858. The whole line is to be bought partly

by the Austrian and partly by the Hungarian Government in the year 1895. The business done during the seven preceding years is to regulate the price of the railroad. It is for this reason that separate accounts have been kept for the part of the line running through Austria and the part running through Hungary.

The principal line belonging to this company runs southward from Vienna through Graz, Marburg, and Laibach to Trieste, with an extension from Trieste to Fiume.

The distance from Vienna to Graz is 228 kilometers (143 miles); from Graz to Marburg, 65 kilometers (40 miles); from Marburg to Laibach, 155 kilometers (96 miles); from Laibach to Trieste, 146 kilometers (91 miles), and from Vienna to Trieste, 594 kilometers (369 miles).

The condition of the line is the same as that of other Austrian lines. It is well and solidly built, and kept in excellent order. The cross-ties are of pine wood and are embedded in stone ballast. In the way of rolling stock, there were 665 locomotives, 622 tenders, 14 water wagons, 1,470 passenger cars, and 1,229 freight cars at the commencement of the year 1893. With a total net of 2,178 kilometers belonging to the company and 375 kilometers of rented lines, the receipts were $16,464,566; the expenditures, $8,908,642; making a net profit of $7,556,924.

The Südbahn is a double-track line the entire distance between Vienna and Trieste. This route is through a mountainous country, and the grades are often steep, especially at the Semmering Pass.

Two through express and two through accommodation trains leave Vienna for Trieste and Trieste for Vienna daily.

The passenger rates are in accordance with distance. The fare from Vienna to Trieste is, first class, 24.15 florins, or $9.66; Vienna to Graz, $4.12; Graz to Marburg, $1.24; Marburg to Laibach, $2.38; Laibach to Trieste, $1.62.

The K. k. Ferdinand-Nordbahn line.—The Nordbahn Railroad, which belongs to a private company, has a concession from 1886 to 1940, but is to be bought by the Government after the 1st of January, 1904. The main line is between Vienna and Cracow; it passes through no cities of any size, but connects with the Russian railroads on the frontier.

The length of the line from Vienna to Cracow is 413 kilometers (256.6 miles). It has double tracks and is in good condition. As the country through which it runs is, for the greater part, flat, there have been no engineering difficulties of importance to contend with in constructing the track.

Three express and two accommodation trains leave Vienna daily for Cracow, and two express and three accommodation trains make the return trip. The price, first class, from Vienna to Cracow is $5.40.

In the year 1892 the company of the Nordbahn had under its control 1,321 kilometers (820.8 miles) of tracks, spent $6,849,721, earned $12,223,475, and made a net profit of $5,374,754.

Oesterreichische Ungarische Staats-Eisenbahn-Gesellschaft.—The main line of this railroad is between Vienna and Bodenbach, and passes through Brunn and Prague. It connects with the German line running to Dresden. The Staats-Eisenbahn-Gesellschaft belongs to a private company and the Hungarian Government, the company owning such parts of the line as are in Austrian territory. The Austrian Government will be able to buy such parts of this railway system as belong to the company after the 1st of January, 1895.

The main line from Vienna to Bodenbach is 540 kilometers (335.6 miles); i. e., from Vienna to Brunn, 156 kilometers (97 miles); from Brunn to Prague, 254 kilometers (158 miles), and from Prague to Bodenbach, 130 kilometers (81 miles).

The line has a single track from Vienna to Brunn and a double track from Brunn to Bodenbach.

There are one express and two accommodation trains daily from Vienna to Bodenbach, and two express trains that go from Vienna to Brunn, on the Ferdinand-Nord-Bahn, and then by the double-track line of the Eisenbahn-Gesellschaft to Bodenbach. From Bodenbach to Vienna there is one express train less than in the opposite direction.

The fare from Vienna to Bodenbach, first class, is $6.12; from Vienna to Brunn, $1.80; from Brunn to Prague, $2.40; from Prague to Bodenbach, $1.92. With a net total of 1,365 kilometers (838 miles) the Oesterreichische-Ungarische Staats-Eisenbahn-Gesellschaft earned $9,362,046 and spent $3,930,563, making net profit of $5,431,483.

K. k. Oesterreichische Staatsbahnen.—The Austrian State line from Vienna to Salzburg was built by a private company with a government guaranty, and was known as the Kaiserin-Elisabeth or Westbahn. In 1880 it and all the lines belonging to the Westbahn-Gesellschaft were purchased by the Austrian Government.

Its termini are Vienna and Salzburg, while the one place of importance through which it passes is Linz.

The total length of the line is 314 kilometers (195 miles), viz: From Vienna to Linz, 189 kilometers (117 miles), and from Linz to Salzburg, 125 kilometers (78 miles).

From Vienna to Wels, a distance of 213 kilometers (132 miles), there is a double track, but through the mountainous country between Wels and Salzburg there is only a single track. It is between Wels and Salzburg that the greatest difficulties in constructing the line were encountered, the Aralberg tunnel, in particular, being a masterpiece of engineering.

There are one accommodation and two express trains from Vienna to Salzburg, and one express train passing through Salzburg on the way from Vienna to Zurich. From Salzburg to Vienna there are two daily express and three accommodations trains besides the through trains from Vienna to Zurich.

With the exception of a few small lines the fares on all the Government railroads are regulated by distance, the fare being about 18 cents for every 10 kilometers (6.2 miles) or fraction thereof on an express train, first class, and about 12 cents, first class, on an accommodation train. On most of the Austrian railroads the second-class fare is two-thirds of the first, and the third class a fraction higher than one-third of the first class.

Freight classification in force on the most important Austrian railroads.

Articles.	Südbahn, Nordbahn, and Staats-Eisenbahn-Gesellschaft.			K. k. Oesterr. Staatsbahnen.[1]		
	Under 5,000 kilograms.	5,000 kilograms.	10,000 kilograms.	Under 5,000 kilograms.	5,000 kilograms.	10,000 kilograms.
Waste of sheep wool	II.	II.	II.	II.	A. T., IV*a*.	A. T., IV*b*.
Cotton:						
Raw and waste	II.	A.	A.	II.	A.	A. T., IV*c*.
Common	II.	A.	A.	II.	A.	A. T., IV*a*.
Lead	II.	A.	B.	A.	A.	B.
Brandy, rum, cognac	II.	A.	A.	A.	A.	A. T., IV*c*.
Cut metal	II.	A.	A.	II.	A.	A. T., IV*c*.
Steam boiler up to 6.3 meters	II.	A.	B.	A.	B.	B.
Wire	II.	II.	II.	II.	A. T., IV*a*.	A. T., IV. B.
Iron and steel	II.	A.	B.	A.	B.	B.
Iron and steel ware	II.	A.	A.	A.	B.	B.
Iron and steel, raw	II.	A.	A.	B.	B.	C.
Mineral colors in bags	II.	A.	C.	II.	A.	C.
Ore	II.	A.	[2]3	II.	A.	B.
Dyeing wood, all sorts of	II.	A.	A.	II.	A.	A. T., IV*c*.
Skins, raw, salted, and dried	II.	A.	B.	II.	A.	B.
Tallow, etc	II.	A.	B.	II.	A.	B.
Flax	II.	A.	C.	II.	A.	C.
Yarn:						
Single	II.	A.	A.	II.	A.	A. T., IV*c*.
Two or more twisted together	II.	II.	II.	II.	A. T., IV*a*.	A. T., IV*b*.
Tanning materials	II.	A.	B.	II.	A.	B.
Corn and pulse	A.	A.	[2]I.	A.	A.	[2]I.
Skins, raw and salted	II.	A.	A.	II.	A.	A. T., IV*c*.
Wood:						
Logs, boards	II.	A.	A.	II.	A.	A. T., IV*c*.
Stem staves	II.	A.	[2]2	II.	A.	[2]2
Leather, etc	II.	II.	II.	II.	A. T., IV*c*.	A. T., IV*b*.
Linen goods	II.	A.	A.	II.	A.	A. T., IV*c*.
Locomobiles	------	------	C.	------	------	B.
Machines, agricultural	II.	A.	B.	II.	A.	B.
Metal	II.	A.	A.	II.	A.	A. T., IV*c*.
Furniture, bent wood	II.	II.	II.	II.	A. T., IV*a*.	A. T., IV*b*.
Oils, etc., in barrels	II.	A.	A.	II.	A.	A. T., IV*c*.
Oil, mineral	II.	A.	A.	II.	A.	A. T., IV*c*.
Plows	II.	A.	B.	II.	A.	A. T., IV*c*.
Bags:						
Used	[2]1	[2]1	[2]1	[2]1	[2]1	[2]1
New	A.	A.	A.	A.	A.	A. T., IV*c*.
Ropemakers' goods	II.	A.	A.	II.	A.	A. T., IV*c*.
Tobacco, raw	II.	A.	A.	II.	A.	A. T., IV*c*.
Sugar, all sorts of	II.	A.	A.	II.	A.	A. T., IV*c*.

[1] *Special tariff of the Imperial Royal Staatsbahn, in kreutzers per 100 kilograms (220.46 pounds) per kilometer (0.621376 mile).*

Distances.	IV*a*. 5,000 kilos.	IV*b*. 10,000 kilos.	IV*c*. 10,000 kilos.
	Kreutzers.	*Kreutzers.*	*Kreutzers.*
From 1 to 50 kilometers	0.45	0.40	0.33
From 51 to 150 kilometers	.40	.35	.26
From 151 to 300 kilometers	.35	.30	.22
Over 300 kilometers	.26	.23	.18

[2] Special tariff.

Rates for fast and ordinary freights on the Austrian railroads.

[In kreutzers (*a*) per 100 kilograms (220.40 pounds).]

From or to Vienna	Kilometers.	Fast freight.		Slow freight.								
		Ordinary.	Reduced		Class.		Car-lading class.			Special tariff.		
					I	II	A	B	C	1	2	3
Imperial Royal Southern Railroad, Vienna to Trieste:		*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Kreut.*	*Krt.*	*Krt.*
Gratz	224	248	233	208.5	139	106.5	89	53	43.5	66	59	40
Marburg	290	318	289	271.5	181	136	110	65.5	52	83	74.5	47
Laibach	445	468	351	406.5	271	196	147.5	92.5	70	119	103	62
Trieste	584	608	407	532.5	355	252	178	118	86.5	152.5	119.5	76
Imperial Royal Emperor Ferdinand Northern Railroad, Vienna to Cracow:												
Preran	184	304.4	112.6	168.8	112.6	96	68.6	53.8	34.6	47.8	35.6	31.1
Mahr.-Ostrau	268	438.8	162.1	243.2	162.1	138	95.8	74.3	43.3	64.6	44	38.4
Oderberg	276	451.6	166.8	250.2	166.8	142	98.3	76.2	44.1	66.2	44.8	39.1
Cracow	413	620	247.7	371.5	247.7	187.9	134.6	104.1	57.8	91.1	60.3	50
Imperial Royal Austrian State Railroad, Vienna to Salzburg:												
St. Polten	61	86	43	.....	43	36	27	20	17	21	17	15
Amstetten	125	156	78	.....	78	64	44	33	26	35	26	23
Steyr	185	224	112	.....	112	90	60	44	33	47	33	29
Linz	189	224	112	.....	112	90	60	44	33	47	33	29
Wels	213	256	128	.....	128	102	67	50	37	53	37	32
Salzburg	314	368	184	.....	184	143	91	67	47	72	47	41
Austro-Hungarian State Railroad, Vienna to Bodenbach:												
Brunn	....	240.4	89	131.9	89	68	55	43.4	29.8	39.7	32	29.1
Zwittau	....	396.9	153.7	196.6	138.9	102.3	88.6	74.5	51.2	69	53.9	36.5
Bohm.-Trubau	....	430 6	166.4	209.7	149.4	108.9	93	79.6	51.2	72.2	53.9	38.1
Chozen	...	480.1	188.1	230.2	164.9	119.1	99.5	88	51.5	77.2	53.9	40.6
Pardubitz	....	547	210	240	180	133	108	92	51.5	80	53.9	43.9
Kolin	....	570	210	240	180	141	110	92	51.5	80	53.9	47.3
Prague	....	570	210.5	294	200	158.2	122	94	53.3	83	55.9	52.3
Kralup	....	623.5	232.6	299	216	169.3	126	97.7	55.8	86	58.2	54.5
Aussig	....	761	290	339	226	198	142	115	65.7	97.1	68	60.9
Bodenbach	....	783	304	343	240	200	145	119	69.4	101	72.4	62.7

a The vice-consul-general values the florin at 40 cents; 100 kreutzers, therefore, equal 40 cents American, 1 kreutzer equals two-fifths of a cent.

HIGHWAYS.

The imperial highways were built before railroads were in use, and are splendid examples of how to build good roads. They are also very well kept. They run from Vienna to every city in Austria, the other cities being connected by roads maintained by the counties or towns through which they pass. The imperial highways, which are macadamized, are maintained by the Imperial Government and have a width of 10 meters (32.8 feet).

DEAN B. MASON,
Vice-Consul-General.

VIENNA, *July 7, 1894.*

BOHEMIA.

RAILWAYS.

The railways of Bohemia are controlled either by the State, called "Staatsbahnen" (State railways), or by private corporations or stock companies, and called "Privatbahnen" (private railways).

State railways.—The main State railway is the K. k. Oesterreichische Staatsbahn (Imperial Royal Austrian State Railway). It starts from Vienna, Austria, and runs to Prague, Bohemia. The length of this road is 350 kilometers (217 miles); touching Gmuend, a distance of 164 kilometers (102 miles); Tabor, 82 kilometers (51 miles); Beneshow, 53 kilometers (33 miles), and Prague, 51 kilometers (32 miles). Over this route are running one limited and four express trains daily, each way. Another line runs from Gmuend to Eger, touching Budweis, a distance of 50 kilometers (31 miles); Pilsen, 135 kilometers (94 miles); Marienbad, 76 kilometers (47 miles), and Eger, 30 kilometers (18.6 miles). The length of this line is 283 kilometers (175.8 miles). At Eger it connects with a Bavarian railway which leads to Mannheim, Paris, etc. Two limited and three express trains run daily each way over this line.

Private railways.—The main private railways are:

The Bœhmische Westbahn (Bohemian Western Railroad) runs from Prague to Brod, in Bavaria, a distance of 191 kilometers (118.5 miles), viz: Beraun, 39 kilometers (24.2 miles); Pilsen, 71 kilometers (44.1 miles); Taus, 59 kilometers (36.6 miles), and Brod, 22 kilometers (13.6 miles). This company runs one limited and three express trains daily, going and coming. At Brod it connects with a Bavarian railway that runs to Munich, etc.

The Buschtehrader Bahn (Buschtehrad Railway) starts from Prague and runs to Eger, a distance of 241 kilometers (149.7 miles), viz: Kladno, 32 kilometers (19.9 miles); Saaz, 74 kilometers (45.9 miles); Komotau, 23 kilometers (14.3 miles); Carlsbad, 60 kilometers (37.3 miles), and Eger, 52 kilometers (32.3 miles). At Eger (the terminus) it connects with German railways that run to Frankfort, and to the seaports of Rotterdam and Amsterdam. Two limited and two express trains run daily each way.

The Oesterreichische Nordwestbahn (Austrian Northwestern Railroad) runs from Tglau to Tetschen, a distance of 259 kilometers (160.9 miles), viz: Tglau to Caslau, 80 kilometers (49.7 miles); Caslau to Kolin, 20 kilometers (12.4 miles); Kolin to Nimburg, 24 kilometers (14.9 miles); Nimburg to Leitmeritz, 84 kilometers (52.2 miles), and Leitmeritz to Tetschen, 51 kilometers (30.7 miles). At Tetschen it connects with Saxon railways, which run to Dresden, Leipzig, Berlin, and the seaports of Hamburg and Bremen. Two limited and four express trains run daily both ways.

The Oesterreich-Ungarische Staatseisenbahn (Austro-Hungarian State Railroad) runs from Bœhmische Truebau to Bodenbach, a distance of 294 kilometers (182.7 miles), viz: From Bœhmische Truebau to Pardubic, 59 kilometers (36.6 miles); Pardubic to Kolin, 43 kilometers (26.8 miles); Kolin to Prague, 62 kilometers (38.5 miles); Prague to Ausig, 107 kilometers (66.5 miles); Ausig to Bodenbach, 23 kilometers (14.3 miles). At Bodenbach it connects with German railways, which run to Dresden, Berlin, Hamburg, and Bremen. Three limited and four express trains run both ways over this line daily.

The Bœhmische Nordbahn (Bohemian Northern) starts from Prague and runs to Rumburg, a distance of 190 kilometers (118 miles), viz: Prague to Yung Bunzlau, 88 kilometers (54.7 miles); Yung Bunzlau to Bœhmische Lipa, 58 kilometers (36 miles); Bœhmische Lipa to Rumburg, 44 kilometers (27.3 miles). At Rumburg it connects with a German railway which runs to Berlin, etc. One limited and two express trains run daily on this road.

CONDITION OF THE RAILROADS.

All the railroads have single tracks, except the Austro-Hungarian State Railroad, which has a double track. The condition of the railroads in this country is exceptionally good. The tracks are laid with heavy steel rails, on oaken or pine cross-ties, imbedded in stone ballast. Bridges are of stone or steel. The tracks are kept in a clean and sound condition. Every railway company has watchmen distributed along its line, 1 kilometer (0.621347 mile) apart. Each watchman is supplied with a comfortable brick cottage, which is built beside the track, where he resides with his family. His duty is to take care of his section of roadway and keep it in good order. No grass is allowed to grow on the road, nor is any person, except railroad officials, allowed to walk on the track, unless a special permit has been obtained from a proper officer; consequently one does not hear of persons being run over by locomotives, unless it be a case of intentional suicide. Each watchman is obliged to walk over his division every time before a passenger train passes over, and to examine the rails carefully. No obstacles worthy of special mention, in grades, bridges, etc., had to be overcome in the construction of railroads in Bohemia.

PASSENGER RATES.

The passenger traffic is regulated here by the zone system (Zonentariff), which divides travel into several classes, called zones. For one or more of these zones tickets are issued that entitle a passenger to travel from the starting place either to the end of the zone or to any point within that zone. The fast and express trains carry cars of three classes. The accommodation trains carry two classes, second and third. Each passenger car is divided into compartments. The cars of the first class are divided into three compartments, each compartment

for six persons. The seats are upholstered and covered with plush. Cars of the second class are divided into four compartments, each compartment for eight persons; the seats are upholstered and covered with leather. Cars of the third class are divided into five compartments, each compartment for ten persons. The cars have plain wooden seats.

The following table shows the division into zones and the fares:

Number of zone.	Kilometers.	Express trains.			Fast trains.		
		First class.	Second class.	Third class.	First class.	Second class.	Third class.
		Florins.	*Florins.*	*Florins.*	*Florins.*	*Florins.*	*Florins.*
1	1 to 10	0.30	0.20	0.10	0.45	0.30	0.15
2	11 20	.60	.40	.20	.90	.60	.30
3	21 30	.90	.60	.30	1.35	.90	.45
4	31 40	1.20	.80	.40	1.80	1.20	.60
5	41 50	1.50	1.00	.50	2.25	1.50	.75
6	51 65	1.95	1.30	.65	2.93	1.95	.98
7	66 80	2.40	1.60	.80	3.60	2.40	1.20
8	81 100	3.00	2.00	1.00	4.50	3.00	1.50
9	101 125	3.75	2.50	1.25	5.63	3.75	1.88
10	126 150	4.50	3.00	1.50	6.75	4.50	2.25
11	151 175	5.25	3.50	1.75	7.88	5.25	2.63
12	176 200	6.00	4.00	2.00	9.00	6.00	3.00
13	201 250	7.50	5.00	2.50	11.25	7.50	3.75
14	251 300	9.00	6.00	3.00	13.50	9.00	4.50

NOTE.—The vice-consul-general estimates the value of the florin at 40 cents.

The average rate per kilometer (0.621376 mile) on express trains is $3\frac{3}{4}$ kreutzers[1] in first class, $2\frac{1}{2}$ kreutzers in second class, and $1\frac{1}{4}$ kreutzers in third class; and on fast trains, 5.35 kreutzers in first class, $3\frac{1}{2}$ kreutzers in second class, and $1\frac{3}{4}$ kreutzers in third class. Children from 2 to 10 years old pay half price. No allowance is made for luggage except what a person can take comfortably into the compartment.

FREIGHT RATES.

Freight rates on short hauls are charged on the same basis as the through traffic rates. For instance, over the Austro-Hungarian State Railway, from Boehmische-Truebau to Bodenbach, a distance of 294 kilometers (182.7 miles), the through rates are 15 florins ($6) per ton of first-class goods, such as wool, cotton, etc; for second class, such as hides, woodenware, etc, 11.40 florins ($4.56), and for third-class goods, such as grain, 8.18 florins ($3.27); for wood, 6 florins 39 kreutzers ($2.56); for stone, 6 florins 10 kreutzers ($2.44).

To find the charge for a ton of first-class freight shipped to some intermediate point, say from Boemische-Truebau to Pardubic, 59 kilometers (36.7 miles), we have only to apply the ratio of 15 florins ($6) for 294 kilometers (182 miles), the through rate, to the 59 kilometers to reach the charge for a ton of first-class freight for the latter distance, viz, 2.95 florins ($1.18).

[1] Kreutzer equals two-fifths of a cent.

MACADAMIZED HIGHWAYS.

These roads are of three kinds, imperial, county, and town or local highways. The imperial roads are supervised and kept at the expense of the Empire. They run continuously through one State into another, and always lead to the imperial capital, Vienna. The county roads are built and kept up by the county governments. Bohemia is well supplied with such roads, which lead in every direction. According to the statistics there are at present 4,293 kilometers (2,668 miles) of imperial roads; 17,852 kilometers (11,093 miles) of county roads, and 4,878 kilometers (3,031 miles) of town roads; total, 27,023 kilometers (16,792 miles), of macadamized highways in Bohemia. The width of the imperial and county roads is 10 meters (32.87 feet); of the town roads, 9 meters (27.86 feet). They are kept in a very good condition. Permanent roadmasters are employed. The law prescribes that to each roadmaster not less that 2,800 yards of the road shall be assigned, and that he shall be on the road every day in the year and take care of his section. Each government supplies the roadmasters, usually in the fall, with broken stone or gravel, which is distributed in small heaps about 50 feet apart alongside the road, for repairs.

NAVIGABLE RIVERS.

There are two navigable rivers in Bohemia, the Elbe and the Moldau. The Elbe flows in a northwesterly course through Bohemia into Saxony; thence to the seaport of Hamburg, emptying into the North Sea. Only small steamers ply on the Elbe in Bohemia, commencing at Melnik. These are mainly employed in towing canal boats, loaded with freight.

The River Moldau flows from the southern part of Bohemia directly north, passing through the city of Prague, and emptying into the River Elbe, at Melnik. On this river only rafts and canal boats are used. Navigation on the River Moldau, from Budweis to Melnik, is 220 kilometers (136.7 miles), and that of the river Elbe, from Melnik to Hamburg, is 610 kilometers (379 miles). Canal boats on the Moldau carry, on an average, 200 tons, and on the Elbe, from 400 to 600 tons.

The freight charges from Prague to Hamburg per ton of sugar are 8 marks ($1.904); on grain, including insurance, 8 marks; on carpet wool, including insurance, 19 marks ($4.52). Rates are made according to the kind of goods.

JOHN KAREL,
Consul.

PRAGUE, *June 9, 1894.*

HUNGARY.

RAILWAYS.

The most important railway lines in Hungary, in connection with international traffic, are: (1) The Royal Hungarian State railways (Die königl. ungar. Staats-Eisenbanen); (2) The Imperial and Royal Incorporated Southern Railway (Die k. u. k. priv. Südbahn); and (3) The Imperial and Royal Incorporated Kaschau-Oderberg Railway (Die k. u. k. priv. Kaschau-Oderberg-Bahn). The first of these is owned and managed by the State; the two latter are private corporations.

The Royal Hungarian State Railways, besides attending largely to the local traffic, both passenger and freight, are auxiliary to the international traffic between Hungary and France, Switzerland, southern Germany, western Germany, eastern Germany (partly), Belgium, Holland, the northern seaports, the East, mainly the Balkan States, and, finally, the international traffic by the seaports of Fiume and Triest.

The Hungarian railway stations connecting with the traffic from abroad are Gyanafalva (Fehring) for the south; Bruck and Marchegg for the southwest and partly the north; Ruttka and Csacza for the north and northeast and Fiume for the Adriatic traffic. The terminal stations of departure for the East (Balkan States) are Predial, Vercierova and Zimony (Semlin). Mention should also be made of the traffic to and from Russia by the transit stations Beskid and Vidrany, and further in connection with the Bosnian traffic as far as the Adriatic seaport of Metkovitz, of the transit station Brod, respectively Bosna-Brod.

The main lines and more important intermediate stations are Marchegg-Predial, with the terminal station Marchegg on the Austrian frontier; the intermediate stations, Pozsony (Pressburg), Budapest, Czegled, Nagy-Varad (Gross-Wardein), Brasso (Kronstadt), and the transit station, Predial; for the traffic by Orsova (Vercierova), the stations, Pozsony (Pressburg), Szeged (Szegedin), Temesvar, Orsova; for the traffic in the direction of Servia, Bulgaria, etc., the station Bruck-Marchegg, on the Austrian frontier, and the intermediate stations, Gyor (Raab), Szabadka (Maria-Tereziopel), Ujvidek (Neusatz), Zimony (Semlin); for the Adriatic traffic, Fiume, Agram, Dombovar, and Budapest. The traffic in the opposite direction passes through the same stations. As to the Russian traffic, it is effected partly by land and partly by sea through the Adriatic seaport of Fiume.

The distances between the terminal stations of the main lines are as follows:

Terminals.	Distance.	
	Kilometers.	*Miles.*
Budapest-Predial	761	472.88
Marchegg-Budapest, Budapest-Orsova	729	453
Bruck (on the Leithe River)-Budapest, Budapest-Semlin	568	358.95
Budapest-Fiume	604	375.54
Uj-Dombovar-B. Brod	274	190.26
Budapest-Beskid	444	276.90
Budapest-Vidrany	406	251.08

The Imperial and Royal Incorporated Southern Railway, as well as the Imperial and Royal Kaschau-Oderberg Railway, runs in both Austria and Hungary, the headquarters of the former being in Vienna, with a managing directory in Budapest, and the headquarters of the latter in Budapest, and managed from there. The management of both of these railways is subject to the supervision of the Hungarian as well as of the Austrian authorities.

The Southern Railway international traffic is conducted as follows: Budapest, from which the Italian traffic is effected, via Kanizsa Cormons, Kanizsa-Pontaffel, and Ala (Peri); the Swiss traffic, via Kanizsa-franzensfesta-Innsbruck, and in part, Kanizsa, Oedenburg, and Vienna; the Adriatic traffic, via Kanizsa, Steinbruck, and Trieste. The lengths of these lines operated in Hungary are:

From—	To—	Distance.	
		Kilometers.	*Miles.*
Budapest	Kanizsa	221	137.33
Kanizsa	Pragerhof	109	67.73
Kanizsa	Becsujhely (Wiener Neustadt)	114	70.84
Zagrab (Agram)	Steinbruck	76	47.23

The Imperial and Royal Kaschau-Oderberg Railway is important, mainly, as a transit railway for international traffic. It connects at Oderberg with the Prussian state railways and the Kaiser-Ferdinand's Northern Railway (Nordbahn), and crosses over into Hungary at Csacza, where it effects a junction with the Russian, east German, and Galician traffic.

Ruttka is a branch station for the traffic to Hungary, Roumania, and Servia. From Ruttka it runs as far as Abos, and a branch line runs from Abos to Orlo, on the Galician frontier.

The terminal station of the main line of the Kaschau-Oderberg railway is Kaschau, from which point the Hungarian railways operate various lines to the southeast and northeast. The Kaschau-Oderberg railway is also of importance for tourists. Its route passes through the most beautiful scenery of the Carpathian Mountains, and is dotted all along the line with charmingly situated and much frequented watering places, which are every year the rendezvous for thousands of people in search of either health or pleasure. These resorts are Csorba, Lucsivna, Poprad-Felka, Tatva-Fured, Iglo, Lublo, and Bartfeld, which is reached by a branch railway from Abos. The length of these lines is: Kaschau-Oderberg, 351 kilometers (218 miles); Abos-Orlo, 87 kilometers (54 miles); Kaschau-Abos, 15 kilometers (9.3 miles).

The foregoing lines are first class. The rolling stock, roadbed, etc., are in fair condition, and collisions and accidents are of rare occurrence. There are double tracks on the lines of the Royal Hungarian State railways from Marchegg as far as Czegled, Budapest, Hatvan, and

Lawoczne. The remaining lines of the State railways, as well as of the Southern and Kaschan-Oderberg railways, are single track. The width of the tracks of all these lines is 1.435 meters (4.7 feet).

Railway zone tariffs.—The rates for passenger traffic in Hungary on all the lines, except the Imperial and Royal Incorporated Southern Railway, are fixed by the so-called zone tariff.

Budapest forms the nucleus or starting point in this respect for the Royal Hungarian State railways in such a way that a passenger for a trip from any given part of the country which would pass through Budapest to another part of the country would be charged separate fares, according to the zone tariff rates from Budapest. To illustrate: If a person undertook a trip from the western frontier, starting from the station Bruck, to Budapest and from Budapest to Orsova, the rates under the zone tariff are fixed under two heads: First, the so-called local traffic for shorter distances, with two zones, 1 and 2; and second, the through traffic for longer distances, with fourteen zones, I to XIV.

The following table shows the rates charged under the zone tariff:

Zone tariff for local and through passenger traffic on the Royal State railways and on the Kaschau-Oderberg Railway.

No. of zone.	Distance.	Ordinary and mixed trains.			Express or fast trains.		
		First class.	Second class.	Third class.	First class.	Second class.	Third class.
	Local lines.	*Florins.*	*Florins.*	*Florins.*	*Florins.*	*Florins.*	*Florins.*
1	First station	0.30	0.15	0.10	.....	.....	.....
2	Second station	.40	22	.15	.....	.....	.....
	Main lines.						
1	1 to 25 kilometers (0.62 to 15.53 miles)	.50	.40	.25	0.60	0.50	0.30
2	26 to 40 kilometers (16.15 to 24.85 miles)	1.00	.80	.50	1.20	1.00	.60
3	41 to 55 kilometers (25.47 to 34.18 miles)	1.50	1.20	.75	1.80	1.50	.90
4	56 to 70 kilometers (34.80 to 43.50 miles)	2.00	1.60	1.00	2.40	2.00	1.20
5	71 to 85 kilometers (44.12 to 52.82 miles)	2.50	2.00	1.25	3.00	2.50	1.50
6	86 to 100 kilometers (53.44 to 62.14 miles)	3.00	2.40	1.50	3.60	3.00	1.80
7	101 to 115 kilometers (62.76 to 71.46 miles)	3.50	2.80	1.75	4.20	3.50	2.10
8	116 to 130 kilometers (72.08 to 80.78 miles)	4.00	3.20	2.00	4.80	4.00	2.40
9	131 to 145 kilometers (81.40 to 90.11 miles)	4.50	3.60	2.25	5.40	4.50	2.70
10	146 to 160 kilometers (90.73 to 99.42 miles)	5.00	4.00	2.50	6.00	5.00	3.00
11	161 to 175 kilometers (100.04 to 108.74 miles)	5.50	4.40	2.75	6.60	5.50	3.30
12	176 to 200 kilometers (109.37 to 124.28 miles)	6.00	4.80	3.00	7.20	6.00	3.60
13	201 to 225 kilometers (124.90 to 139.82 miles)	7.00	5.30	3.50	8.40	6.50	4.20
14	226 and over (140.44 miles)	8.00	5.80	4.00	9.60	7.00	4.80

NOTE.—Although the silver florin, the former monetary unit of Austria-Hungary, was superseded on October 1, 1892, by the gold crown, the gold standard becoming the law on that date, it would seem that all general values are still estimated in the old money unit. The latest valuation of the florin is given, by our consul at Vienna, at 40.6 cents.

Two ordinary first-class fares are charged on the Orient express train. The passenger fares on the Royal and Incorporated Southern Railway are computed according to the following fundamental taxes per person and kilometer: First class, 4.75; second class, 3.56, and third class, 2.57 kreutzers (1.83, 1.44 and 1.94 cents per 0.62137 of a mile), with the additional charge of 20 per cent for express trains.

To further illustrate the zone tariff, let us take the instance cited, of a trip from Bruck to Orsova, via Budapest. The distance between Bruck and Budapest is 228 kilometers (141.68 miles), and belongs, therefore, to the fourteenth zone. The same is the case from Budapest to Orsova, which belongs also to the fourteenth zone, being in excess of 225 kilometers (139.82 miles). According to the principle of the zone tariff, two first-class fourteenth zone fares are charged, namely, 8 gulden ($3.25) each for the trip from Bruck to Orsova, via Budapest, while a trip between Kaschau and Predial, which does not touch Budapest, and covers a distance of 835 kilometers (518 miles) falls also within the fourteenth zone, and costs only a first-class fare of 8 gulden.

The total number of passenger trains arriving at and departing from Budapest in twenty-four hours amounts to 190, 180 belonging to the Hungarian State railways, and 10 to the Southern.

The tariff for freight rates on all the railway lines in Hungary is fixed according to a system based upon a combination having reference to value and bulk.

For quick transit, there is a tariff for common or ordinary freight at reduced rates, embracing perishable (eatable) goods packed in bulk; the freight tariff, however, contains piece goods, and whole cargoes. The tariff for piece goods is divided into two parts, and two classes.

The piece goods first class contains valuable goods, and piece goods second class less valuable articles—the latter to the amount of 5,000 kilograms. The freight for whole wagon or car loads is divided into six different classes, according to the quantities, which are consigned on one bill of lading and the value of the goods. For instance, all piece goods, except the more valuable, sheepskins, furs, etc., if sent on one bill of lading, containing at least 10,000 kilograms, can be sent in a cheaper freight class, as wagonload, Class A.

In Class B the following articles are enumerated: Potash, asphalt, lead, coal tar, certain cement goods, cocoa fiber, roofing paper, steam boilers, iron and steel, railway utensils, railway carriages, which roll on their own wheels, earthen paints, grease, tannin, panes of glass, glassware of all kinds, portable engines, coke, acids, soda, etc., rosin, etc.

In Class C, cement, cement tiles, chamotte, dolomite, red land (magnesia), limestone, iron and steel, raw material, old and broken iron and steel, earth, flax and hemp, herbs, gas retorts, certain qualities of woods, wood fiber, potatoes, tubes, coal tar, and such less valuable articles. Besides, there are special and exceptional tariffs for different articles, according to their value.

With the exception of Class A, the carload tariff quantity must be at least 10,000 kilograms (22,046 pounds). Certain goods, however, are classified according to the payment of freight and the carrying

capacity of the car placed at its disposal. The existing tariff is as follows, in kreutzers per 100 kilograms (0.406 cent per 220.46 pounds):

Stations.	Fast freight.		Slow freight.							
	Ordinary.	Reduced.	I.	II.	A.	B.	C.	Specific tariff, I.	Special tariff, 3.	Exceptional tariff, II.
Marchegg to Orsova *a*	795	393	427	335	170	113	91	122	72	63
Marchegg to Temesvar *a*	605	298	328	225	140	94	74	103	58	51
Marchegg to Budapest *a*	305	145	150	119	62	47	39	49	32	28
Bruck to Semlin	626	309	340	264	144	97	77	106	61	53
Budapest to Beskid	515	253	281	217	125	85	66	94	52	46
Budapest to Fiume	521	258	259	173	146	100	80	93	77	63
Csacza (frontier) to Kaschau	603.9	286.3	177.7	160	96	78.1	59.5	88.3	59.5	43.5
Budapest to Csaktornya	308	283	171	129	106	63	50	84	71	46

a These rates are applicable also for Vienna and Budapest, on account of steamship competition.

For cereals at stations where there is steamship competition there are specially reduced rates, viz:

To—	Distance.		Rate per 220 pounds.	
Competitive rates.	*Kilometers.*	*Miles.*	*Kreutzers.*	*Cents.*
Baja	230	142.92	33	13.4
Ujvedek	272	169.02	44	16.2
Vukovar	291	180.82	40	16.2
Essegg	297	184.55	41	16.6
Semlin	343	213.14	46	18.7
Mitrovika	347	215.62	49	19.9
Noncompetitive rates.				
Brunvocz	230	142.92	63	25.6
Kaschau	272	169.02	70	28.4
Perbenyck	295	183.27	73	29.6
Devecser	298	185.18	73	29.6
Bruck Hunyard	349	216.86	81	32.9
Homonna	350	217.49	81	32.9

Besides these ordinary rates there are also specially reduced rates given for building material, machinery, etc., for new industries; and also, if required and needed, further rebates are granted.

The other Hungarian railways, with their larger stations, participate in the existing tariff of international transit, having direct tariff in transit with Italy, Switzerland, eastern and northwestern France, Belgium, Holland, Germany, and Russia. The Hungarian State railways are in direct communication with the Levant.

In most of these tariffs there are, according to the importance of the goods exported or imported, specific tariffs, when they go or come to prominent commercial centers.

GRADES, TUNNELS, AND BRIDGES.

The most pronounced grades, tunnels, and bridges on the international lines of railway occur on the following lines: On the line from Marchegg to Orsova, the grade near Pressburg (not very heavy); second grade, more noticeable, at Teregova and Porta Orientalis, where

there is a long tunnel; then a grade, of from 1 to 5 per thousand, on the line from Brasso (Kronstadt) to Predial, on the Roumanian frontier. There is a very steep grade on the line from Zolyom to Ruttka, with a very sharp curve of from 1 to 14 per thousand. On this line there is also a very extensive embankment (dike) between Kremnitz and Garam Berzenoze. In former times, especially in the spring, when the first thaws began, and in the summer during rainfalls, landslides took place, so that the whole line was liable to be stopped. Since this embankment (Jaline) was reconstructed of good and solid stone materials no obstructions or interruptions have taken place. On this line there are several tunnels, large and small.

On the Fiume (Carlstadt-Fiume) line the great grade begins at Carlstadt and extends to the plateau of Ogulin, and on toward Fiume, where it obtains its greatest height on the Karst Mountains. On the other side from Fiume to the heights of the Karst there are many grades of 1 to 25 per thousand. From Fiume toward Carlstadt there are several tunnels, and near Fiume a large bridge across the valley. The communication on this line was often troublesome and dangerous, as whole trains were frequently blown off the embankment by the bora (strong northwesterly wind); but of late they have secured a safe service by adding to each train some empty railway carriages.

The most prominent bridges are the railway bridge near Budapest and the bridge at Semlin, crossing the border. There are two large bridges on the Theiss, at Szolnok and Szegedin. There are also, on the Fiume line, a railway ferry from Gombos to Bogajero, the Drave bridge, near Zaikany, and the River Save bridge, near Agram. All the other bridges are unworthy of notice.

RIVER TRAFFIC.

Traffic on the Danube plays a very important part in transportation. Budapest lies in the center, whence the business is conducted to the east and to the west. The Danube enters Hungary at Deveny, dividing the same into two parts, from west to Budapest; from Budapest to Semlin, in the east, and from Semlin to Orsova in the south. The Danube traffic is fed through the Theiss River, which is navigable by steamers from Szolnok to Titel, where it flows into the Danube. The Save is navigable to Sissik, and joins the Danube at Semlin. The Drave, which is navigable as far as Barcs, is a large thoroughfare for goods going to Italy, Switzerland, and southern Germany, via Barcs, where the goods are transshipped. The Bega Canal, from Temesvar to Titel, is also a tributary tc the River Theiss, and thence to the Danube. Then come the Francis Joseph and Francis canals, as short cuts, making the connection between the Danube and the Theiss rivers.

The principal transport company is the Imperial and Royal Danube Steam Navigation Company, whose fleet consists of about 190 steamers and 782 barges, with a total carrying capacity of 276,809 tons. Most

of the freight barges have a carrying capacity of 350 tons, although some of these carry 820 tons and more, while others have not more than 50 tons capacity, the latter being used mainly for transshipping.

Besides the Imperial Danube Company there are two large companies navigating the river, viz, the Hungarian Steamship Company and the South German Steamship Company, and several private companies. The total fleet of these private companies consist of 112 iron boats of 34,486 tons capacity, and about 1,000 larger wooden freight barges, with a carrying capacity of 200,119 tons. This fleet carries annually about 267,911,802 kilometric tons, or 41.3 per cent of the whole water transport, while the first privileged Danube steam navigation company carries 90 per cent of the passenger traffic and 58.7 per cent of the freight traffic.

The main shipping stations are: On the Danube—Komorn, Gyor (Raab), Vacz (Waitzen), Budapest, Baja, Kalocsa, Mohacs, Vukovar, Ujvidek (Neusatz), Zimony (Semlin), Bazias, Drenkovau. Orsova. On the Theiss—Titel, O-Becse, Szeged (Szegedin), Szentes-Csongrad, Szolnok. On the Drave—Esseg, Barcs. On the Save—Schababacz, Breka, Brod, Sickovacz, and Sisek.

The chief articles which enter into the international traffic, especially for those stations beyond Budapest, Theiss, Boga, Francis Canal, Save, and Drave, are cereals of all kinds and tobacco, and from the Save station dried prunes in large quantities, an export to the west via Vienna and Regensburg. Milling products, wine, spirits, oak wood, industrial articles of cloth, glassware, iron, iron goods, paper, porcelain, cement, agricultural machinery, mineral water, millstones, steam boilers, carriages and wagons, salt, sugar, and all kinds of merchandise are exported to the East.

Import articles from the east consist of corn, petroleum, hides, tannin, and spirits from Roumania, largely as transit articles to Germany. Imports from the western part of Germany consist of petroleum, grease of all sorts, oils, coffee, rice, jute thread, wood, colors for paints, spices, and products coming by sea.

The tariff is equal to those of the railways, being divided into three classes, besides the quick-freight tariff, which is divided into two ordinary and reduced quick-freight tariffs. Such goods as are not specially enumerated in the classification belong to the first class. The articles which on account of their value do not belong to the reduced Class B belong to Class A, and are charged accordingly for any given quantity, while in Class B are included all freights amounting to at least 1,000 kilograms.

Besides these three classes, there are for certain stations and goods extraordinary tariffs, for Servia, Bulgaria, Roumania, and Russia, for sugar, plows, leather goods, porcelain, beer, wine, glassware, slate, etc.

Freight rates, per 100 kilograms (220.46 pounds), are:

	Class 1.		Class A.		Class B.	
From Budapest to—	*Kreutzers.*		*Kreutzers.*		*Kreutzers.*	
Orsova	200	$0.812	131	$0.532	85	$0.345
Simla	65	.264	39	.158	26	.105
Szeged (Theiss station)	140	.568	84	.341	56	.227
Temesvar (Bega)	160	.650	98	.398	72	.292
Barcs (Drave station)	135	.548	81	.329	57	.231
	Centimes.		*Centimes.*		*Centimes.*	
Odessa	700	1.351	500	.965	350	.676
Rustchuk	650	1.158	450	.872	300	.579
Sulina	685	1.322	485	.936	335	.646
Belgrade	300	.579	180	.347	124	.232
From Vienna to—	*Kreutzers.*		*Kreutzers.*		*Kreutzers.*	
Barcs	215	.873	129	.524	97	.394
Mohacs	170	.730	102	.414	76	.308
Esseg	200	.812	120	.487	88	.357
Sissek	250	.102	150	.609	108	.428
Szeged	224	.898	132	.546	96	.390
	Centimes.		*Centimes.*		*Centimes.*	
Belgrade	475	.917	285	.550	205	.396
Odessa	850	1.640	600	1.158	425	.820
Sulina	835	1.611	585	1.129	410	.792

The Danube Steam Navigation Company maintains, in connection with the Austrian Lloyds, a regular service to Galatz, and thence to Batoum, Constantinople, and the south coast of the Black Sea.

The other transport companies have no fixed tariff, but they make tariffs from time to time, which are governed according to supply and demand. At present there is a large transport company to be launched with a capital of 5,000,000 florins ($2,030,000). The technical and administrative departments are being created, and work will begin in a short time. The company will navigate the whole of the Danube and its tributaries, as well as provide sea transportation.

EDWARD P. T. HAMMOND,
Consul.

BUDAPEST, *April 30, 1895.*

ITALY.

OCEAN LINES.

Of the ocean lines controlled by corporations, the Navigazione Generale Italiana, the Puglia, and the Siciliana lines receive subsidies from the Government.

Navigazione Generale Italiana.—The wealthiest—paid-up capital of 50,000,000 lire ($9,650,000)—and most important steamship company is the Navigazione Generale Italiana. In 1892 this company paid a dividend of 4½ per cent on its stock. Its fleet consists of 105 English-built iron steamers, ranging from 522 to 4,580 tons; total tonnage, 106,908 tons; total horsepower, 43,788.

The ocean lines operated by the Navigazione Generale are:

(1) Naples, Genoa, Montevideo, Buenos Ayres (fortnightly); mail service, calling at Barcelona and St. Vincent (Cape Verde Island) or

Las Palmas. Distance from Genoa to Buenos Ayres, 6,231 miles; fare, 750 to 1,000 francs ($144.75 to $193); freight, 27.50 francs ($5.31) per ton. Steamers of about 4,000 tons and 5,000 horsepower. This company sends steamers once a month (commercial service) from Genoa and Naples to New Orleans, to Rio Janeiro and Santos, and to New York.

(2) The Bombay line, from Genoa, Naples, Messina, Venice, Ancona, Bari, and Brindisi; departures every four weeks, calling at Alexandria, Port Said, Suez, and Aden, in connection with Singapore and Hongkong monthly branch.

Mail service.—Passenger fare, first-class, from Genoa to Aden, £24 ($116.78); to Bombay, £40 ($194.64). An allowance of 10 per cent is made on the return voyage to passengers reembarking within twelve months, of 20 per cent within six months and of 25 per cent within three months.

Freight rates from Italian ports.—To Aden and Bombay, $4.866; to Ceylon, $7.30; to Singapore, $8.51; to Hongkong, $12.17. Steamers of about 4,000 tons register and 3,000 horsepower.

The distances between the ports to which the steamships of this company ply are:

From—	To—	Distance.	From—	To—	Distance.
		Miles.			*Miles.*
Genoa	Naples	335	Suez	Aden	1,307
Naples	Messina	176	Aden	Bombay	1,632
Messina	Alexandria	843	Bombay	Singapore	2,450
Alexandria	Port Said	157	Singapore	Hongkong	1,412
Port Said	Suez	88			

(3) The Mediterranean international and great coastwise lines:

Lines and ports.	Distances.	First-class fare.
(a) Genoa Alexandria-Massowah line; monthly.		
Genoa to—	*Miles.*	*Francs.*
Leghorn	71	15 = $2.90
Naples	269	60 = 11.58
Messina	166	120 = 23.16
Alexandria	843	292 = 56.36
Port Said	157	347 = 66.98
Suez	88	393 = 75.85
Massowah	955	.....
(b) Venice Brindisi-Alexandria; fortnightly.		
Venice to—		
Ancona	123	30 = 5.79
Bari	215	58 = 10.99
Brindisi	62	66 = 12.74
Alexandria	873	251 = 98.25
(c) Genoa Naples-Malta-Tripoli; weekly.		
Genoa to—		
Naples	335	52 = 10.04
Messina	176	110 = 21.23
Reggei	7	100 = 21.23
Catania	47	124 = 23.93
Syracuse	30	135 = 26.06
Malta	83	.....
Tripoli	198	.....

(*d*) *Civita Vecchia-Golfo Aranci.*—Island of Sardinia, mail steamers six times a week.

(*e*) *Naples-Messina;* bi-weekly.—Skirting the coast of Calabria, touching at Diamante, Paola, and Pizzo.

There is a daily line of steamers (Italian and Austrian) between Venice and Triest and between Ancona and Fiume.

The Puglia Steamship Company.—This company has a capital of 1,000,000 francs ($193,000), owns 11 steamers of 6,584 tons and 1,694 horsepower, and paid 8 per cent dividend in 1892. The steamers of this line are engaged exclusively in the coastwise trade, principally that of the Adriatic.

The Puglia Company operates the following lines: Venice to Brindisi, weekly; Bari to Ancona, Zara, and Fiume, fortnightly; Brindisi to Fiume, weekly; Venice to Taranto fortnightly.

The Siciliana Line.—The small steamers belonging to this line make daily trips from Mellazzo, Sicily, to the Lipari Islands and weekly trips from Messina to the same islands.

The Veloce Steamship Company of Genoa.—This company, with a capital of 13,000,000 francs ($2,209,000), paid its stockholders a 5 per cent dividend in 1892. It owns 9 steamers of 25,076 tons and 11,468 horsepower (nominal). It engages almost exclusively in the South American and Central American trade. It operates lines as follows:

(1) Steamers of about 4,500 tons register and 6,500 horsepower, three times a month to Buenos Ayres, 6,231 miles, calling at Montevideo. Fare, from 750 to 1,000 francs ($144.75 to $193); freight, 25 to 35 francs ($4.83 to $6.75) per ton.

(2) Steamers of about 2,000 tons register and 2,500 horsepower, to Colon, 5,850 miles, once a month, calling at Barcelona, La Guayra, Puerto Cabello, Curacoa, and Cartagena. Freight, 25 to 35 francs ($4.83 to $6.75) per ton.

(3) To Santos, Brazil, 5,337 miles, calling at Pernambuco, Bahia, and Rio Janeiro. Fare, 550 francs ($106.15); freight, 45 to 55 francs ($8.49 to $10.62) per ton.

Foreign lines.—There are a number of foreign steamship companies whose ships touch at Italian ports.

The North German Lloyd Steamship Company runs the following lines out of Genoa:

(1) To Southampton, 2,134 miles; fortnightly. Fare, £8.13s ($43.08). Steamers 4,500 tons register and 3,500 horsepower.

(2) To New York, 4,100 miles, touching at Gibraltar, trimonthly. Fare, 650 francs ($125.45); freight, 15 to 25 shillings ($3.65 to $6.08) per ton. Steamers of about 5,000 tons register and 6,500 horsepower.

(3) To Sydney, 10,357 miles. Fare, 1,110 marks ($264.18); freight, 25 to 45 marks ($6.95 to $10.71) per ton. One sailing per month. Steamers 3,500 tons register and 2,500 horsepower.

(4) To Shanghai, 8,811 miles. Fare, 1,435 marks ($341.53); freight, 35 shillings ($8.52) per ton. One sailing a month. Steamers of about 5,000 tons register and 3,600 horsepower.

The splendid steamers of the Peninsular and Oriental Steamship Navigation Company and of the Orient Line touch at Naples and Brindisi on their way to Egypt and the East.

Coastwise rates.—The passenger and freight rates by the subsidized steamship lines, so far as the coastwise traffic is concerned, are regulated by act of Parliament. The law declares that passenger fare shall be charged in proportion to the distance traveled, and divides the distances into five zones, viz: First zone, 1 to 20 leagues; second zone, 20 to 40 leagues; third zone, 40 to 80 leagues; fourth zone, 80 to 240 leagues; fifth zone, upward of 240 leagues.

The following are the ruling rates of travel by sea per league:

Zone.	First class.	Second class.	Third class.
	Centesimo.	*Centesimo.*	*Centesimo.*
First	0.75	0.50	0.25
Second	.60	.40	.20
Third	.45	.30	.15
Fourth	.30	.20	.10
Fifth	.15	.10	.05

NOTE.—Centesimo equals 0.01 lira, or 0.193 cent United States currency.

Merchandise is divided into four classes. Freight is charged by weight. The law prescribes that the rate shall be in proportion to the distance, viz:

Distance.	First class.	Second class.	Third class.	Fourth class.
	Lire.	*Lire.*	*Lire.*	*Lire.*
For 20 leagues and less	2.55	1.91	1.48	1.25
From 20 to 100 leagues, additional for each 10 leagues	.124	.1	.074	.05
From 100 to 200 leagues	.062	.05	.037	.025
For 200 leagues and upward	.031	.025	.018	.014

NOTE.—Lira equals 19.3 cents United States currency.

LAKE SERVICE.

This service is done by companies styling themselves "navigation companies." The steamboats vary in size from 10 to 200 tons. They carry the mails, passengers, and freight. The passenger fare, first class, and the freight rates on the different lakes are practically the same. The passenger fare, first class, is regulated on the basis of $7\frac{1}{2}$ centesimi ($1\frac{1}{2}$ cents) per kilometer (0.62137 mile). The freight rate is from 5 to 12 cents per metrical quintal (220.46 pounds) according to distance, calculated by zones of 25 kilometers (15.53 miles).

A steamboat touches, in summer, at every landing, both ways, at least twice a day.

Lake Garda.—The navigation company of Lake Garda owns 8 steamboats, of 1,501 tons and 460 horsepower.

Lake Como.—The Lariana Steamboat Navigation Company owns 16 steamboats, of 877 horsepower.

Lake Lugano.—The fleet of the Lake Lugano Navigation Company consists of 6 steamboats, of 130 tons and 745 horsepower; also 3 flat-bottomed freight barges, of 110 tons. This company owns and operates the railroads connecting Lake Lugano with Lake Como, and the line from Portesse to Menaggio that connects Lake Lugano with Lake Maggiore, and the line from Ponte Tresa to Luino.

Lake Maggiore.—The Lake Maggiore Navigation Company owns 12 steamboats, of 1,443 tons and 2,790 horsepower.

RIVERS AND CANALS.

The only navigable river in Italy is the Tiber, between Rome and Fiumicino, a small port at the mouth of the river, a distance of 20 miles. The railroad that follows the Tiber from Rome to Fiumicino handles most of the freight.

Steamers of 200 tons occasionally ascend the Tiber, laden with wine from Sicily. Barges, loaded with firewood, are floated down the river to Rome.

The business by way of the canal from Pisa to Leghorn is insignificant.

RAILWAYS.

The first railway in Italy, from Naples to Castellamare, was opened to the public on October 4, 1839 At the end of 1871 the railway mileage was 8,154, and at the end of 1892 it was 8,742 miles, without counting the steam trams (narrow-gauge roads), the mileage of which, on January 31, 1891, was 1,587.

The law of April 27, 1885, changed the system of management of Italian railroads. Up to that date there had been four great lines: (1) The Upper Italy Railroad; (2) the Roman Railroad; (3) the Italian Southern Railroad; (4) the Calabro-Sicilian Railroad. Prior to July 1, 1885, the first two lines belonged to and were managed directly by the State; the third, belonging to the State, was run at the expense and for account of the State by the Italian Southern Railroad Company, which operated for its own account the fourth line (also the property of the State), of which it was the lessee.

By the law of 1855, the Sicilian railroads were made a separate and distinct system, and the Continental railroads were divided into two longitudinal lines, called the Mediterranean line and the Adriatic line, from their respective proximity to the two seas that wash the shores of Italy.

Of the 5,563 miles of railway in operation prior to the 1885, 4,470 were operated by the State, and 1,093 miles by private parties. For this partly governmental and partly private system of management, the contracts approved by the law of April 27, 1885, substituted, so far as the four roads mentioned are concerned, a new and uniform system. The roads are now operated by companies, under the supervision of the State, which shares in the profits to a certain extent and in certain proportions, according to the gross earnings and eventually

according to the net earnings, assigning a portion of the profits to the keeping up of the roads, to the extension of the same, and to the care of the property.

The contracts approved by the law of 1885 will run for sixty years, divided into three periods of twenty years each, with the privilege to all parties concerned to withdraw from the contract by giving two years' notice.

The Mediterranean System.—This line, carrying passengers, through mails, and freight, is the property of the State, but it is operated, as stated, by the Mediterranean Company. This road may be said to have three northern termini, viz:

(1) Modane is the first station west of the great tunnel of the Mont Cenis. Modane is the frontier town between France and Italy, and a French as well as an Italian custom-house is established there. The great trunk line from Modane to Reggio di Calabria, the southern terminus, is 1,075 miles long, and passes through Turin, Genoa, Spezia, Pisa, Rome, Naples, and Metaponto. The Modane-Reggio line has a double track from Modane to Turin and from Turin to Genoa; a single track from Genoa to Spezia. Between these two points there are ninety-three tunnels. The road follows the seashore closely, and the hills in many places come abruptly down to the water. The double track has not been completed yet between Spezia and Rome and Rome and Naples. There is but one track from Naples to Reggio. The distances are as follows:

From—	To—	Miles.	From—	To—	Miles.
Modane	Turin	57	Naples	Metaponto	170
Turin	Genoa	103	Metaponto	Reggio	270
Genoa	Pisa	103			
Pisa	Rome	208	Total		1,075
Rome	Naples	162			

At Modane the Mediterranean line connects with the Paris, Lyons and Mediterranean, a French line. The route via Genoa, Turin, Modane, Culoz, Maen, and Dijon is the shortest between Rouse and Paris.

(2) Ventimiglia is the second northern terminus of this line. This is the frontier town, on the Riviera, between France and Italy. Here this line again connects with the Paris, Lyons and Mediterranean Railroad. Distance from Ventimiglia to Genoa, 94 miles (single track). Travelers enter Italy from Nice by this route.

(3) Pino Trouzano, a frontier town between Italy and Switzerland, is the third northern terminus of the Mediterranean system, which connects here with the St. Gothard Railroad, which leads to Lucerne and Central Europe. Distance from Pino Trouzano, via Lerino, Novara, Mortara and Alessandria, to Genoa, 140 miles. Single track from Pino to Alessandria; double track from Alessandria to Genoa.

Milan, the great industrial city of Italy, is connected with Turin (double track) via Novara and Vercelli, distance 93 miles; also with

Turin, via Mortara and Casale (single track), distance 80 miles; and lastly with Turin (double track), via Pavia, Alexandria, and Asti, distance 98 miles.

A new and important line has just been opened from Spezia to Parma, distance 75 miles.

A double-track line runs from Leghorn to Florence, distance 60 miles, via Pisa and Empoli. Distances are as follows:

From—	To—	Miles.
Leghorn	Pisa	11
Pisa	Empoli	29
Empoli	Florence	20
Total		60

At Empoli a single-track line runs, via Sienna, to Chiusi, a distance of 95 miles, where connection is made with the line from Rome to Florence, which belongs to the Adriatic system.

From Naples a single-track line runs via Cancello and Avellino to Benevento, 78 miles, and connects at this point with the Adriatic system.

From Metaponto a single-track line runs to Brindisi via Faranto, 70 miles.

The Adriatic system.—The second great trunk line in Italy is known as the Adriatic line, running from Chiasso, the northern terminus, to Gallipoli, the southern terminus, 702 miles, passing through Milan, Piacenza, Parma, Modena, Bologna, Faenza, Ancona, Pescara, Foggia, Bari, and Brindisi. Distances are as follows:

From—	To—	Miles.	From—	To—	Miles.
Chiasso	Milan	32½	Ancona	Pescara	92¼
Milan	Piacenza	43	Pescara	Foggia	110½
Piacenza	Parma	35½	Foggia	Bari	77
Parma	Modena	33	Bari	Brindisi	70
Modena	Bologna	23¼	Brindisi	Gallipoli	57½
Bologna	Faenza	31¼			
Faenza	Ancona	96¼	Total		702

There is a double track from Chiasso to Bologna, a single track from Bologna to Gallipoli.

An important branch of this road runs from Milan to Venice (double track) passing through Brescia, Verona, Vicenza, and Padua. The distances are as follows:

From—	To—	Miles.
Milan	Brescia	51¼
Brescia	Verona	42½
Verona	Vicenza	30
Vicenza	Padua	18¾
Padua	Venice	23¼
Total		165¾

From Venice to Ponteba, on the Austrian frontier, the road is single track; it passes through Treviso and Udine. The distances are as follows:

From—	To—	Miles.
Venice	Treviso	18¾
Treviso	Udine	66¼
Udine	Ponteba	43
Total		128

Ponteba is on the road from Venice to Vienna. At Udine there is a single-track branch road to Cormons, on the Austrian frontier; distance, 13 miles. This road leads to Triest.

From Brescia there is a single-track road running to Cremona and Piacenza. Distance from Brescia to Cremona, 31¼ miles; from Cremona to Piacenza, 18¼ miles.

There is a single-track branch road from Verona to Modena, 63¾ miles, passing through Mantua. The distance from Verona to Mantua is 25 miles, and from Mantua to Modena 38¾ miles.

There is a single-track road from Padua to Bologna, via Rovigo and Ferrara; distance, 77 miles.

Another single-track road runs from Bologna to Leghorn (115 miles), passing through Pistoia (branch road here leads to Florence, 21 miles), Lucca, and Pisa.

The last important line belonging to the "Adriatic system" that we have to mention is the line from Rome via Sulmona to Castellamare Adriatico, 150 miles.

The network of railways in Italy is quite complete. Almost every town is now connected by rail with its neighbors.

Sicilian railways.—When the gap between Patti and Cefalu, on the north coast of Sicily, and the gap between Porto Empedocle and Castelvetrano, on the southern coast, shall have been completed, the island of Sicily will be belted. The distances by rail between important points in Sicily are as follows:

From—	To—	Miles.	From—	To—	Miles.
Messina	Catania	60	Catania	Palermo	152
Catania	Syracuse	54	Palermo	Trapani	122
Syracuse	Licata	132			

Sardinian Railway.—This road, from Cagliari to Golfo degli Arami, 192 miles, with branches to Iglesias and Sassari, runs almost through the center of the island. Sardinia is undeveloped, and the road is run at a loss to the Government.

PASSAGE AND FREIGHT RATES.

Italy has spent enormous sums—3,840,093,740 francs ($741,138,092)—in the construction of her railroads, and is at this date paying in interest,

etc., 40,000,000 francs ($7,720,000) annually for the privilege of railroad communications. The investment, in the end, will no doubt prove profitable. The condition of the roads is good. Streams and rivers are spanned by substantial iron bridges.

The Italian railroads, as has been already said, are operated by companies, under the supervision of the State. Passenger fares and freight rates are fixed by act of Parliament in proportion to the distance traveled; hence, there is no competition, no cutting of rates, possible between the lines, and pooling of freights, terminal charges, and short hauls have no existence in Italy. The passenger rates per kilometer (0.621376 mile) are as follows:

Trains.	First class.	Second class.	Third class.
	Centesimi.	*Centesimi.*	*Centesimi.*
Express	12.43	8.71	.....
Omnibus	11.30	7.91	5.09

NOTE.—100 centesimi equal 19.3 cents.

There is no allowance for baggage, but passengers are permitted to take with them in the coaches bundles weighing not more than 20 kilograms (44.09 pounds) and measuring not more than 0.50 by 0.25 by 0.30 meter (9.8 by 11.9 by 19.8 inches). Baggage pays the same rate as fast freight, namely, 9 cents per ton per kilometer. The rate per car load (8 tons) for fast freight is 0.9040 franc (17.44 cents) per ton per kilometer.

Express trains are expected to make from 34 to 37 miles an hour.

MONT CENIS TUNNEL.

On October 25, 1870, a notable event took place, which, however, passed unnoticed by the greater part of France, owing to the then recent military reverses and to the fact that the invading armies were laying siege to the capital itself.

The event in question was the piercing of Mont Frejus. At 20 minutes past 4 in the afternoon the marvelous machines which had been at work uninterruptedly for more than twelve years in the bowels of the earth, nearly 5,000 feet beneath the most elevated point, penetrated through the interposing wall of rock, and the following day the last barrier separating the two sections of the tunnel was removed by blasting.

There is little need to insist on the immense importance of this work. Its value had been accurately estimated beforehand, and the years which have since elapsed have furnished ample proof of its industrial and practical success.

The Alps had always been a serious obstacle to the commercial relations between France and Italy, even when they no longer formed an impassable barrier. Up to the commencement of this century there

was no carriage road over the mountains, and all merchandise had to be transported by means of mules.

Until the month of June, 1868, all traffic across Mont Cenis was carried on by means of the existing road. But in winter and during rough weather considerable time was occupied in the transit; the road over the pass was frequently blocked by avalanches, and the mountain could then only be crossed in sledges. In spite of the loss of time which necessarily resulted from such a state of things, the carriage road across Mont Cenis greatly facilitated commercial relations between France and Italy. The diligence service was excellently conducted and was as rapid as possible, but the state of the weather could not be entirely disregarded; traffic was therefore restricted within certain limits, and was chiefly confined to the transport of small packages of merchandise, such as were required to be forwarded by express.

The diligence and wagons for the conveyance of goods by road were at length superseded by Fell's railway. Although this constituted a considerable advance in the means of locomotion, it could only be regarded as temporary, and the very light construction of the line rendered it much less useful than it would have been if more powerful locomotives could have been employed on it.

It is easy to understand that the opening of the tunnel, permitting, as it did, of the transportation of unlimited quantities of merchandise in the most rapid manner, was destined to exercise an important influence upon the commerce of the two nations, and that it fully justified the expectations of the authors of the work and the rejoicings which greeted its accomplishment on October 25, 1870.

A few days after the boring was completed a festival was held in celebration of the event. This was but just to the workmen, whose arduous labors had been crowned by so brilliant a success. Sad as the state of France then was, Frenchmen had not lost all interest in this magnificent undertaking, conceived in propitious times, but brought to a successful conclusion in an era of calamity.

The length of the Mont Cenis tunnel in a straight line, as first made, was 13,364 yards, or about 7½ miles. In consequence of the various deviations from the original track, rendered necessary by different causes, the length of tunnel which the trains now traverse is 14,951 yards. Its altitude at the Modane end is 3,802 feet; at the highest point, 4,245 feet, and at the Bardonecchia end, 4,236 feet.

The Mont Cenis tunnel runs from northwest to southeast, from Modane to Bardonecchia. It traverses the following strata of rock: (1) The stratum of granular limestone forming the base of the system and constituting the Italian slope of the mountain through which the tunnel is bored; 10,272 yards. (2) The stratum of massive limestone, in part thrown out of position, near the Col d'Arionda; 386 yards. (3) The stratum of quartz rock above Modane, one of the sections which gave the most trouble, owing to the hardness of the rock; 420 yards. (4) Deposits of anthracite near the Savoy end; 2,270 yards.

The difficulties encountered were greater on the Modane side than on the Bardonecchia side, owing to the occurrence of quartzy rocks, sandstone, and pudding stone, while on the Italian side granular limestones, easily pierced, were chiefly met with.

The Modane entrance to the tunnel is 344 feet above the river channel; the Bardonecchia end is on a level with the river on that side. On the north side the gradient is 25 in 1,000, while on the south side it is the minimum necessary to allow water to flow off—0.5 in 1,000. The summit of the mountain is about 5,900 feet above the tunnel.

There is a double line of rails through the tunnel, with a footpath on either side. The interior height of the tunnel is 19.6 feet; its breadth, 26.2 feet at the spring of the arch, and 25.9 feet at the base of the jamb stones. At Modane the arch is semicircular, while at Bardonecchia it is of elliptical form. The stone lining of the tunnel has a thickness of from 1.7 to 3.2 feet, according to the pressure of the earth. The tunnel is illuminated by gas lamps at intervals of about 500 yards, each indicating the distance in kilometers.

After having made the reader acquainted with the principal facts relating to this magnificent work, which has the merit of having been the first of its kind, it remains to say a few words respecting the manner in which the task of excavation was carried out.

The rock was removed by blasting with gunpowder, but the augers which pierced the holes to receive the charges were put in motion by little machines called perforators, which were themselves worked by compressed air furnished by special machines known as compressors, set up at each end of the tunnel and receiving their motive power from a water course. On the Bardonecchia side the torrent of Melezet was made use of, its waters being conveyed a distance of 2 miles through a cleverly arranged system of pipes. At Modane, or rather at Fourneaux, the same service was performed by the Arc, but as the natural fall of the stream was insufficient it was raised by means of four water wheels and pumps to a height of 85 feet. At either end of the tunnel there were ten ram-stroke compressing engines. At Modane there were, besides, two compressing engines with double-acting pistons, worked directly by two water wheels and compressing air continuously.

The compressed air in the reservoirs was conducted as required to the spot where work was going on by a cast-iron pipe 7 inches in diameter. It was then distributed by means of india-rubber pipes to the perforators and to the water cylinders, serving to inject water into the holes for the charges.

Each perforator was composed of two small compressed-air engines, resembling horizontal steam engines, one of which, called the motrice, with double action, imparted a slow movement of rotation to the auger, which at the same time caused the hinder engine, called the percuteur, to advance. The two machines composing the perforator were

mounted on an iron framework, fixed at any inclination desired, on an iron carriage called an affût, which moved on rails to the front of the opening and carried from five to eight perforators, according to the number of holes to be bored, as well as the water cylinder which poured a continuous jet of water into the holes. Each perforator was arranged to give 200 strokes per minute. The excavation at first followed a small gallery 11½ feet in width and 8 to 10 feet in height, at the bottom of the tunnel.

Relays of workmen following each other at intervals of eight hours worked at the blasting, at the advancement of the rails and the boring engines, at fixing, directing, and removing the apparatus, at charging and exploding the mines, and at removing the débris of the rocks. Thirty-seven workmen were employed simultaneously in this work. The enlargement of the gallery to its full size and the lining of the tunnel were carried on in the ordinary way. The work of boring began at the close of 1855, was completed, as we have seen above, toward the end of 1870, and the tunnel was opened for traffic in September, 1871. The undertaking thus occupied about fifteen years.

During the four years when the ordinary process was employed, the mean annual advance was 197 yards from the Bardonecchia end and 250 yards from the Modane end. Afterwards, when the aid of machinery had been enlisted, the mean annual advance was 688 yards from the Bardonecchia end and 468 yards from the Modane end, where the occurrence of extremely hard quartz rock rendered the work of excavation a very difficult one.

The total cost of this tunnel through the Alps was about $15,000,000, or over $1,100 per linear yard.

The number of workmen employed on this gigantic work was, at each end, 1,500 during the winter and 2,000 during the summer. Including the families which many of the workmen brought with them, M. Grattoni estimates that on the average there were not less than 3,000 persons attracted by the works to the vicinity of either end of the tunnel.

The first to conceive the idea of piercing the Alps was a land surveyor of Bardonecchia, Joseph Medail, who, in 1832, began making plans, measuring the distance between that place and Modane, and seeking the spot where the fewest difficulties would present themselves in the construction of a tunnel. At that date his project was regarded as chimerical, but ten years later he laid it once more before the Chamber of Agriculture and Commerce at Chambery, which, after a favorable report by M. de Mortillet, accorded it its entire approbation.

In 1845, the Piedmontese Government intrusted a Belgian engineer, M. Maus, with the task of making new surveys for the practical realization of the project. M. Maus invented a boring machine which worked admirably, and there was every prospect of the undertaking being successfully carried out, when the war of 1848, ending in the disaster of Novara, compelled the Government to defer the execution of this plan, which had, for the moment, excited universal interest.

In the surveys which were made after peace was concluded, two names are conspicuous, those of Colonel Menabrea and of the civil engineer, Paleocapa, long minister of public works, and an active colleague of Count Cavour, and to them the solution of this question is certainly, in great part, attributable. But however important a part was played by MM. Menabrea and Paleocapa, it was reserved to Cavour, by effecting the financial restoration of his country, to bring the enterprise to a successful termination.

Cavour, by his clever maneuvers and bold devices, brought public opinion to a point at which resistance on the part of the Sardinian Parliament was no longer possible, and his financial combinations were so well devised that the Victor Emmanuel Railway Company agreed to provide no less than 20,000,000 francs of the total amount required.

Science soon placed all its resources at the disposal of Cavour; Maus's machine was succeeded by that of M. Colladon, an engineer of Geneva; then, almost at the same time, by the apparatus invented by Mr. Bartlett, and afterwards by the machines furnished by MM. Someiller, Grandis, and Grattoni, which latter were definitely adopted. The project was sanctioned by a decree of April 15, 1857, and on the 30th of the same month the work of excavation was commenced by King Victor Emmanuel, who fired the first charge of powder.

Officially, the works were commenced, but experiments with the object of discovering the best system of boring and also the most suitable apparatus for producing and conducting the motive force, namely, compressed air, were still continued, though the work was proceeding all the time, especially from the Bardonecchia end.

The annexation of Savoy to France in 1860, considered by some persons as likely to cause the suspension of the work on the tunnel, had the contrary effect of facilitating it. The French Government undertook to contribute the sum of 19,000,000 francs, on the condition that the work be completed in twenty-five years. A premium of 500,000 francs was promised for each year gained out of the twenty-five, and the premium was to be increased to 600,000 francs for each year gained in case the work was completed within fifteen years.

By a special contract entered into on October 31, 1867, the engineers Grattoni and Someiller agreed to complete the tunnel before the close of 1871, and this was done. On September 15, 1871, three trains started, one after another, from Turin, conveying to Bardonecchia the Italian guests invited to take part in the opening ceremony, among them numerous senators and deputies, together with several ministers.

HIGHWAYS.

In Italy, the minister of public works sees to the laying out, making, and repairing of the national, provincial, and communal highways. The national roads are those which connect the chief cities of the Kingdom with each other and with the seaports. The provincial roads are

those which connect the capitals of the different provinces, those which connect the capitals of the respective provinces with the seats of the several districts into which the provinces may be divided, and those which connect the capitals of the provinces and the seats of the several districts with the nearest ports. Communal roads are those which connect the county seats with the other towns in their districts. All other public roads are vicinal roads, and are kept up by the communal authorities. All these roads are macadamized and are kept in good order. A bicyclist would find it an easy matter to traverse Italy in every direction.

The national and provincial roads are 26 feet and the communal roads 16 feet in width.

WALLACE S. JONES,
Consul-General.

ROME, *August 14, 1894.*

GENOA.

Since November, 1891, great changes have taken place in maritime traffic to and from the port of Genoa. At that date the North German Lloyd Steamship Company of Bremen, as an experiment, placed one of its fine steamships on the route between the ports of New York and Genoa. Encouraged by the well-filled staterooms on the steamship *Fulda* and heavy shipments of merchandise to and from both ports, the company placed still another steamer, the *Werra*, on what is now popularly known as the Mediterranean service. Even this addition did not provide for the demands made on the company, so the steamship *Kaiser Wilhelm II* was put on this line, and later, other steamers of the company.

Noticing the success of the North German Lloyd, the Hamburg-American Packet Company, during the winter months of 1892–93 and 1893–94, placed several of its magnificent steamships on the Mediterranean service. This company was well patronized also, for it continued oriental excursions with the New York-Gibraltar-Genoa service. Soon after the arrival of any of these steamships, scores of Americans can be seen examining objects of interest in this old city. The same cause which created a demand for more steamship accommodations from New York to Genoa has brought about an extra demand for railroad transportation from this point to the two Rivieras, the Italian lakes, to Nice, Florence, Rome, Milan, Turin, and Switzerland.

The importance of this New York-Gibraltar-Genoa route to American merchants, travelers, and students is so fairly presented in a pamphlet issued by the German companies above named, who "pooled their issues" last January, and now run the Mediterranean service as under one management, that I clip the following extracts therefrom:

The Genoa-New York line offers the best opportunity for returning home to American travelers staying in Italy, the south of France, Switzerland, and on the

Riviera, because Genoa, on account of its geographical situation, as well as in consequence of its excellent communications, can be easily reached from all countries, and because the German companies have placed on this route the largest, safest, and swiftest steamships of the Continent. Pegli, San Remo, Bordighera, Mentone, Monaco, Monte Carlo, Nice, Antibes, Cannes, Bellinzona, Chiasso, Florence, Turin, Venice, and Milan are only about four to six hours distant from Genoa. The following table shows the approximate distances and fares:

From Genoa (or vice versa) by rail to—	Duration of journey.	Fare.		From Genoa (or vice versa) by rail to—	Duration of journey.	Fare.	
		First class.	Second class.			First class.	Second class.
	Hours.	*Francs.*	*Francs.*		*Hours.*	*Francs.*	*Francs.*
Alexandria	1¾	10.00	6.90	Milan	3	20.00	14.40
Arona	5	23.00	16.25	Monaco	5¾	22.50	16.25
Bellaggio	7	30.00	20.65	Monte Carlo	5½	22.50	15.60
Bellinzona	7½	35.00	24.40	Naples	19	97.50	68.75
Bologna	8¼	38.75	27.50	Nice	7	24.40	16.90
Brescia	5½	30.75	21.25	Padua	6¾	50.00	35.00
Cannes	7½	27.50	19.40	Pallanza	8¼	25.00	17.50
Chiasso	4½	26.90	18.75	Pisa	4	22.00	15.60
Como	4½	26.25	18.75	Pavia	2½	15.65	10.65
Florence	6	32.50	23.00	Rome	12¾	65.60	45.65
Leghorn	5	24.40	16.90	San Remo	4	17.50	12.50
Locarno	8	33.15	23.75	Trieste	16	82.00	58.15
Lucerne	13½	57.50	40.65	Turin	4	22.00	15.60
Lugano	6¾	29.35	21.25	Venice	7½	55.00	38.75
Luino	6½	28.15	19.40	Verona	6	39.35	28.15
Marseilles	13½	50.60	35.00	Zurich	14¾	60.65	42.50
Mentone	5½	22.00	15.60				

From Genoa and Naples to New York fares vary according to location and size of cabins, a reduction being made when occupied by three adults or more. Berths are to be had as follows:

First saloon, express steamer, 450 gold-francs and upwards, viz, 550, 650, 750, 850, 1,100, and 1,400 gold-francs. Return tickets, 855 gold francs and upwards.

Second saloon, express steamer, 300 and 350 gold-francs. Return tickets, 570 and 665 gold-francs.

Return tickets available for the steamers of both lines from and to New York, Naples, Genoa, Algiers, Gibraltar, Hamburg, Bremen, London, Southampton, Havre, and Paris.

Special round-trip tickets issued for the route Genoa, Gibraltar, Algiers, Naples (Palermo), Genoa, available from any of the ports named.

Direct connection from Genoa and Naples to Egypt and the East by the North German Lloyd's imperial mail steamers.

Special connecting service between Naples and Palermo by companies' own steamers.

Passengers allowed to stop over at all intermediate ports, and to continue voyage by steamers of both lines, without extra charge.

Through tickets to Athens, Constantinople, Smyrna, and all other ports in the Mediterranean touched by the steamers of the Austrian Lloyd.

The companies being under contract with the German and Austrian State railways, issue, in connection with steamship tickets, original railway tickets to all principal railway stations in Germany and Austria, available for one year, at tariff rates.

The railroad fares quoted above are not all accurate, but the differences between the fares quoted and actual rates, where mistakes exist, are merely nominal.

So popular has this route become, that the Cunard Steamship Company proposes to employ its two largest steamers in the Mediterranean service the coming autumn and winter.

THE PORT OF GENOA.

The arrivals and departures of vessels to and from the port of Genoa during the year 1892, according to the latest statistics published, were:

Description.	Arrived.		Departed.	
	Number.	Tonnage.	Number.	Tonnage.
Steamers	2,957	2,987,275	2,951	2,980,738
Sailing vessels	2,899	328,715	2,812	326,685

The foregoing vessels represented nearly every nation on earth. England heads the list in numbers, having 863 steamers credited to her in arrivals; Italy is next, then Germany and France in the order named. Many of the English steamers are freighters and come here laden with coal, returning to either Cardiff or Newcastle after discharge of cargo in ballast, where they are again loaded.

OCEAN LINES.

The steamship companies control their own lines. The Italian Government pays them a certain subsidy for carrying the mails to South America and India.

The principal steamship companies operating at this port and coastwise from Genoa are the Navigazione Generale Italiana, with a fleet of 100 steamers; La Veloce (Italian also), whose 11 steamers are actively engaged in the passenger traffic between Genoa and South American ports; North German Lloyd Company, whose steamships, estimated to number 75, run regularly from this port to Naples, Australia, Southampton, and New York.

The Peninsular and Oriental Company has a fleet of 54 steamers, some of which run regularly between Genoa and Alexandria, Egypt.

The Netherlands, Belgium, France, Spain, and Greece take part in the passenger and freight traffic at this port, but not at all in such proportions as the companies above mentioned.

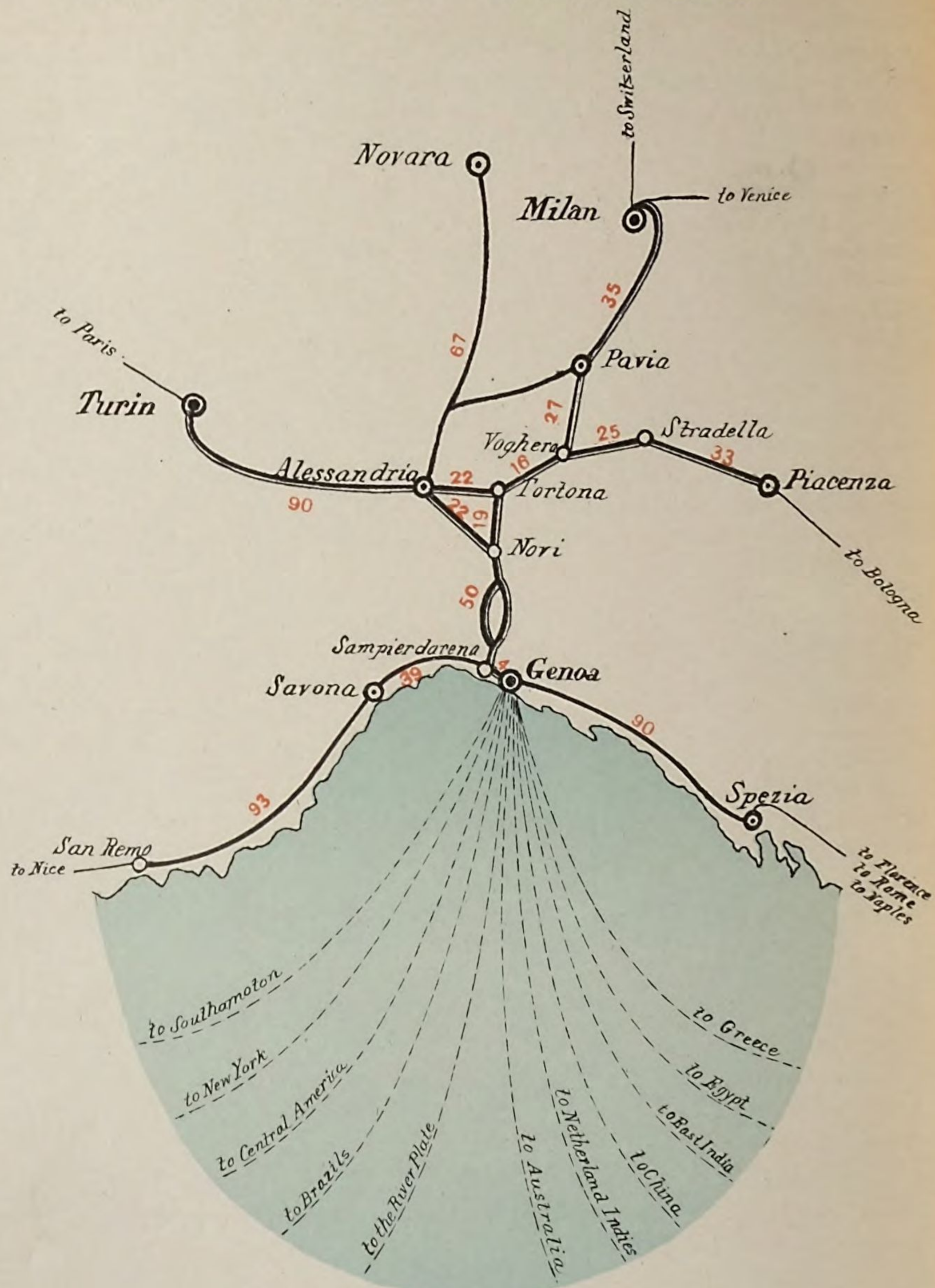
The principal steamship companies whose vessels start from or call at this port, with tonnage and horsepower of steamers, rates of passage and freight, sailings, termini and distances, are as follows:

North German Lloyd Steamship Company.—To Southampton (2,134 miles). About two sailings per month. Fare, £8 13s. Steamers of about 4,500 tons register and 3,500 horsepower.

North German Lloyd Steamship Company and *Hamburg-American Packet Company.*—To New York (4,100 miles). Fare, 650 to 1,400 francs. Freight, 15s. to 25s. 3d. per ton. Calling at Gibralter (850 miles). Fare, 200 francs. About three sailings per month. Steamers of about 5,000 tons register and 6,500 horsepower.

La Veloce Steamship Company.—To Colon (5,850 miles), calling at Barcelona, La Guayra, Puerto Cabello, Curacao, Sabanilla, and Cartagena. No passengers. Freight, 25 to 35 francs per ton. One sailing per month. Steamers of about 2,000 tons register and 2,500 horsepower.

CHART: RAILROADS IN THE DISTRICT OF GENOA.



Double track
Single track } Railroad lines
Ocean lines

figures indicate the distances in Kilometres from Station to Station.

To Santos (5,337 miles), calling at Pernambuco, Bahia, and Rio Janeiro. Fare, 550 francs. Freight, 45 to 55 francs per ton. One sailing per month. Steamers of about 2,000 tons register and 1,600 horsepower.

To Buenos Ayres (6,231 miles), calling at Montevideo. Fare, 750 to 1,000 francs. Freight, 25 to 35 francs per ton. Three sailings per month. Steamers of about 4,500 tons register and 6,500 horsepower.

Navigazione Generale Italiana.—To Buenos Ayres (6,231 miles), calling at Montevideo. Fare, 750 francs. Freight, 27.50 francs per ton. Two sailings per month Steamers of about 4,000 tons register and 5,000 horsepower.

North German Lloyd Steamship Company.—To Sydney (10,357 miles), calling at Naples, Port Said, Aden, Colombo, Adelaide, Melbourne. Fare, 1,110 to 1,600 marks. Freight, 25 to 45 marks per ton. One sailing per month. Steamers of about 3,500 tons register and 2,300 horsepower.

Nederland Steamship Company.—To Batavia (7,033 miles), calling at Padang. Fare, 1,470 francs. Freight, 45 to 60 francs per ton. Two sailings per month. Steamers of about 2,000 tons register and 1,400 horsepower.

North German Lloyd Steamship Company.—To Shanghai (8,811 miles), calling at Naples, Port Said, Aden, Colombo, Singapore, and Hongkong. Fares: To Colombo, 1,000 marks; to Singapore, 1,230; Hongkong, 1,330; Shanghai, 1,435. Freight, 25s. to 32s. 6d. per ton. One sailing per month. Steamers of about 3,500 tons register and 3,500 horsepower.

Navigazione Generale Italiana.—To Bombay (4,473 miles), calling at Alexandria and Aden. Fare, £40. Freight, 20s. per ton. One sailing per month. Steamers of about 4,000 tons register and 3,000 horsepower.

Peninsular and Oriental Steam Navigation Company.—To Alexandria (1,329 miles), calling at Naples and Brindisi. Fare, £12. Freight, 10s. to 20s. per ton. About two sailings per month. Steamers of about 3,000 tons register and 2,500 horsepower.

Navigazione Generale Italiana.—To Piraeus, calling at Leghorn, Naples, Palermo, Messina, and Catania. Fare, 235 francs. Freight, 15 to 50 francs per ton. One sailing per week. Steamers of about 2,500 tons register and 1,000 horsepower.

RAILROADS.

All the railroads in Italy are owned by the Government, but they were leased a few years ago to corporations for a period of ninety-nine years, subject, however, to certain supervision and taxation.

From Genoa, the main points touched (by rail) in this consular district are Savona and San Remo, en route to Nice, and Chiavari, Sestie, Levante, and Spezia, en route to Pisa, Leghorn, Florence, and Rome. Inland from Genoa the traveler is taken to Novi (in this district) where other roads meet and branch out to Alessandria and Turin in one direction and to Piacenza, Novara, Pavia, and Milan in other directions. For further particulars as to railroads examine accompanying chart. The railroad which extends along the coast from Spezia to San Remo has only one track, but there are side tracks at every station. Inland from Genoa there are double tracks.

In this consular district, fully ninety-nine one-hundredths of the road-bed is on solid rock, and fully one-half the length of the road runs through a portion of the Appenines and Maritime Alps. For instance, from Genoa to Spezia, a distance of about 53 miles, there are eighty-four tunnels, and from Genoa to San Remo, 85 miles, the train is continually

running out of one tunnel to enter another. Also, on leaving Genoa for either Turin or Milan the same monotony exists until the train reaches Novi and Alessandria.

The track is not smooth, owing to its rocky bed. Repairs are slowly made on account of the numerous trains—freight and express—which are moving day and night in different directions to and from Genoa.

To give even an epitome of the history of the building and completion of the railroads in this consular district, would take too much space in this report. It may be stated, however, that it is the boast of the country that Italian workmen and Italian engineers, after battling with natural obstacles for many years, finally forced their way through the hearts of mountains and united rock-bound and sea-bound Genoa by rail with the principal cities of Italy.

The fast trains running daily from Genoa to the several points within this district are: To San Remo, 1; to Turin, 5; to Novara, 4; to Milan, 6; to Piacenza, 2; to Spezia, 4.

First-class railroad fare is 0.1243 lira[1] per kilometer, (0.621376 mile). Freight by fast train, 0.452 lira per ton per kilometer.

There are three printed volumes on the subject of freight charges, from which it will readily be understood how difficult it would be to give further items that would be of iterest to the American public.

HIGHWAYS.

There is really but one highway of any importance in this district. This extends along what is known as the East and West Coast. It is known as the old Roman road from Spezia to Genoa, and as the Corniche road from Savona to San Remo and Nice. Its width will hardly average 36 feet, besides sidewalks at certain points. Some portions of the road will not measure more than 12 or 15 feet in width, owing to the lofty and almost perpendicular mountains in such close proximity to the sea. This highway is of but minor importance now except for the delightful excursions which pleasure seekers have thereon, for small steam tugs and lighters and railroad trains deliver, so to speak, merchandise at the very doors of the inhabitants of the province.

There are a few good highways running inland from Genoa about the same width as the Roman-Corniche road, but public traffic on these roads is not of much importance.

JAMES FLETCHER,
Consul.

GENOA, *July 21, 1894.*

---

[1] Lira = 19.3 cents United States currency.

PALERMO.

OCEAN LINES.

Phelps Line.—Controlled by a corporation; headquarters, Liverpool. Route, from New York, New Orleans, or Boston, to Palermo, Messina, Catania, Girgenti, and vice versa. Communication every ten or twelve days.

Condition of line, good. Number of vessels, seven; the smallest having a net tonnage of 1,076; the largest, 1,735; average, 1,383. Vessel having least nominal horsepower has 200; having greatest, 300; an average of 243. This is a freight line only.

Wilson Line.—Controlled by a corporation; headquarters, Hull. Route, from Hull to Palermo, thence to Adriatic ports, and vice versa. Communication, monthly.

Condition of line, good. The number of vessels of this line calling regularly is nine, the smallest having a net tonnage of 550; the largest, 1,914; average, 1,162. Nominal horsepower of the smallest vessel, 98; of the largest, 250; average, 171. This is also a freight line.

Glynn Line.—Controlled by a corporation; headquarters, Liverpool. Route, from Liverpool to Marseilles, Genoa, Naples, Messina, Catania, Palermo, and vice versa. Communication every ten or twelve days.

Condition of line, good. Four vessels of this line ply regularly between Liverpool and Palermo. The smallest vessel registers 666 tons net; the largest, 1,034 tons; average, 870 tons. The nominal horsepower of the smallest vessel is 99; of the largest, 195; average, 147. These vessels carry freight only.

Cunard Line.—Controlled by a corporation; headquarters, Liverpool. Route, from Liverpool to Genoa, Naples, Palermo, Messina, and Adriatic ports. On return from Adriatic ports vessels rarely call at Palermo, except during fruit season, and proceed to Liverpool via some Spanish port. Communication monthly.

Condition of line, good. Eight vessels are engaged in the trade. The smallest vessel registers 1,215 tons net; the largest, 1,533 tons; average, 1,370 tons. The nominal horsepower of the smallest vessel is 212; of the largest, 300; average, 257. These vessels carry freight only.

Sloman Line.—Controlled by a corporation; headquarters, Hamburg. Route, from Hamburg to Mediterranean ports and Palermo; returning via same or other Mediterranean ports. Communication about every ten days.

Condition of line, good. Number of vessels, five. The smallest vessel registers 845 tons net; the largest, 1,009 tons; average, 925 tons. The nominal horsepower of the smallest vessel is 125; of the largest, 150; average, 140. A freight line only.

Cockerill Line.—Controlled by a corporation; headquarters, Antwerp. Route, from Antwerp, via Mediterranean ports, to Palermo; returning via same or other Mediterranean ports. Communication fortnightly.

Condition of line, good. Number of vessels, six. The smallest vessel registers 717 tons net; the largest, 1,352 tons; average, 1,029 tons. The nominal horsepower of the smallest vessel is 90; of the largest, 180; average, 135. These vessels carry freight only.

Leyland Line.—Controlled by a corporation; headquarters, Liverpool. Route, from Liverpool to Palermo, returning via Mediterranean ports for cargo. Communication monthly.

Condition of line, good. Number of vessels, six. The smallest vessel registers 1,131 tons net; the largest, 1,444 tons; average, 1,257 tons. The nominal horsepower of the smallest vessel is 200; of the largest, 250; average, 220. A freight line only.

Anchor Line.—Controlled by a corporation; headquarters, Glasgow. Route, United States ports to Mediterranean ports, and vice versa. Carry freight only.

Condition of line, good. The vessels of the Anchor Line plying between United States ports and Mediterranean ports number fourteen. But few of these called at Palermo within the last year, and those that called were chartered vessels and were run in conjunction with other lines. The smallest vessel registers 1,214 tons net; the largest, 3,275 tons; average, 1,948 tons. The nominal horsepower of the smallest vessel is 182; of the largest, 500; average, 378.

Adria Line.—Controlled by a corporation; headquarters, Trieste. Route from Trieste, via principal Mediterranean ports, to Hull, and vice versa. Communication fortnightly.

Condition of line, good. Number of vessels, thirteen. The smallest vessel registers 707 tons net; the largest, 1,422 tons; average, 994 tons. The nominal horsepower of the smallest vessel is 120; of the largest, 260; average, 180. These vessels carry both freight and passengers.

Koninklyke Nederlandsche Stoomboot Maatschappy.—Controlled by a corporation; headquarters, Rotterdam. Route, Holland ports, via some Mediterranean ports, to Palermo, and vice versa. Communication fortnightly.

Condition of line, good. Number of vessels, five. The smallest vessel registers 596 tons net; the largest, 869 tons; average, 745 tons. The nominal horsepower of the smallest vessel is 110; of the largest, 180; average, 138. These vessels carry freight only.

General Steam Navigation Company.—Controlled by a corporation; headquarters, London. Route, from London to Genoa, Leghorn, Naples, Messina, and Palermo, and vice versa. Communication fortnightly.

Condition of line, good. Number of vessels, eight. The smallest vessel registers 454 tons net; the largest, 803 tons; average, 550 tons. The nominal horsepower of the smallest vessel is 110; of the largest, 150; average, 124. These vessels carry freight only.

Navigazione Generale Italiana.—Controlled in part by Italian Government; headquarters, Rome and Naples.

First route: From Marseilles to Genoa, Leghorn, Naples, Palermo, Messina, Piraeus, Salonica, Constantinople, and Odessa, and vice versa. Communication fortnightly. Condition of line, good. Average size of vessels, about 1,600 tons net; average indicated horsepower, about 1,400. These vessels carry freight, mail, and passengers.

Second route: From Marseilles to Genoa, Leghorn, Naples, Palermo, Messina, Piraeus, Smyrna, Constantinople, and Odessa, and vice versa. Communication fortnightly. Condition of line, good. Average size of vessels, about 1,600 tons net; average indicated horsepower, about 1,400. These vessels carry freight, mail, and passengers.

Third route: From Marseilles to all large Italian ports, to Trieste, and vice versa. Communication weekly. Condition of line, good. Average size of vessels, about 1,000 tons net; average indicated horsepower, about 1,000. Vessels carry freight, mail, and passengers.

Fourth route: From Palermo to Trapani, Marsala, and Tunis, and vice versa. Condition of line, good. Average size of vessels, about 500 tons net; average indicated horsepower, about 600. Communication weekly. Vessels carry freight, mail, and passengers.

Fifth route: From Palermo to all ports of northern Sicily, Messina, Catania, Syracuse, and Malta, and vice versa. Condition of line, good. Average size of vessels, about 500 tons net; average indicated horsepower, about 600. Communication weekly. Vessels carry freight, mail, and passengers.

Sixth route: From Palermo to all ports of southern Sicily and Syracuse, and vice versa. Condition of line, good. Average size of vessels, about 500 tons net; average indicated horsepower, about 600. Communication weekly. Vessels carry freight, mail, and passengers.

Seventh route: From Palermo to Naples, and vice versa. Condition of line, good. Number of vessels, five. The smallest registers 550 tons net; the largest, 774 tons; average, 650 tons. The indicated horsepower of the smallest vessel is 800; of the largest, 2,600; average, 1,440. Communication daily. Vessels carry freight, mail, and passengers.

Eighth route: Palermo to Naples and New York or New Orleans. Condition of line, good. Vessels average about 1,600 tons net; average indicated horsepower, about 1,500. Communication very irregular. During 1893 eleven vessels cleared from Palermo. Vessels carry passengers and mail only.

Distances, in leagues, between Palermo and the principal cities having communication by water therewith; also first-class passenger rates and the rate per ton for freight occupying about 40 cubic feet of space per ton.

Cities.	Distance.	Passenger rates.	Freight rates.	Cities.	Distance.	Passenger rates.	Freight rates.
Naples	56	$7.15	$2.80	Taranto	138	$19.80	$2.50
Leghorn	141	17.75	2.50	Brindisi	189	25.50	2.50
Genoa	168	19.90	2.50	Trieste	319	31.85	2.50
Marseilles	236	28.40	3.25	Venice	343	33.95	2.50
Messina	41	6.00	2.25	Tunis	71	16.20	3.00
Catania	59	12.40	2.40	London	761	.....	2.50
Piraeus	224	32.15	3.50	Liverpool	766	.....	2.50
Smyrna	297	29.45	5.00	Hull	854	.....	3.50
Salonica	312	36.55	5.00	Rotterdam	828	.....	2.50
Constantinople	421	44.90	5.00	Antwerp	816	.....	2.50
Odessa	536	65.30	7.00	Hamburg	901	.....	5.00
Syracuse	72	13.30	2.50	New York	1,364	.....	3.00
Malta	101	18.25	3.00	New Orleans	1,837	.....	4.50

Number of steamers of different nationalities clearing from Palermo during 1893, also the aggregate tonnage of same.

Nationality.	Number of vessels.	Tons.	Nationality.	Number of vessels.	Tons.
British	281	321,431	Austrian	40	29,116
Italian	1,320	840,514	Greek	18	16,524
German	46	50,113	Other countries	1	428
Dutch	28	22,078			
Norwegian and Swedish	7	5,720	Total	1,772	1,317,767
Belgian	31	31,843			

RAILWAYS.

Palermo to Corleone.—Controlled by a corporation. Length of line, 42 miles. Communication twice daily.

Palermo to Marsala and Trapani.—Controlled by a corporation. Length of line, 121 miles. Palermo to Marsala, 101 miles. Communication twice daily.

Palermo to Roccapalumba and Porto Empedocle.—Controlled by a corporation. Length of line, 90 miles. Palermo to Roccapalumba, 43 miles. Communication twice daily.

Palermo to Termini, Catania, and Messina.—Controlled by a corporation. Length of line, 211 miles. Palermo to Termini, 23 miles; Palermo to Catania, 150 miles. Communication twice daily.

Rate per mile for first-class passengers on all roads, 3.8 cents.

Freight is divided into eight classes. There is a rate for each class. Besides the cost of hauling, a small fee, varying from 40 cents to 20 cents a ton, depending on the class, is charged. The following are the rates for hauling per ton per mile for the eight classes for the first 75 kilometers (46½ miles). After every 75 kilometers a slight reduction is allowed.

Class.	Rate.	Class.	Rate.
	Cents.		*Cents.*
First	5.8	Fifth	2.5
Second	4.4	Sixth	2.2
Third	3.8	Seventh	1.9
Fourth	3.2	Eighth	1.6

There are no rivers or canal lines in this district, nor are there any first-class highways.

WILLIAM H. SEYMOUR,
Consul.

PALERMO, *November 1, 1894.*

MALTA.

OCEAN LINES.

Peninsular and Oriental Line.—This is the principal line of steamships that touch at Malta. It is incorporated by royal charter dated December 31, 1840, and is further empowered by subsequent charters. The authorized capital is $17,000,000 (paid up, $11,284,280), and authorized debentures, not issued, $5,493,200.

Concerning the business and financial condition of the company, the fifty-third annual report of the secretary to the board of directors, December 12, 1893, says:

> It has been impossible to refer to the state of the eastern shipping trade during the last two years otherwise than in a tone of discouragement, and up to the moment of writing this report that trade has not experienced any revival. Some benefit has been felt on the China line through an agreement among the principal companies to maintain a common understanding as to rates, and by similar means a very slight advantage has accrued in the outward business to India. On the other hand, the homeward rates, both from Calcutta and Bombay, have been deplorable, and so far as the Australian colonies are concerned, both the outward and homeward rates have been most unsatisfactory, while at the same time the volume of business has been seriously diminished. The further heavy fall in silver has necessarily increased the loss in exchange from which the company has suffered for so many years.

Notwithstanding the "deplorable" and "unsatisfactory" condition of business during the year, dividends equal to 10 per cent were declared on the preferred and deferred stocks.

The termini are London, Sydney, and Yokohama, and the main points touched are Gibraltar, Malta, Marseilles, Genoa, Naples, Brindisi, Alexandria, Port Said, Aden, Bombay, Colombo, Madras, Calcutta, Penang, Singapore, Hongkong, Nagasaki, Hiogo, Albany, Adelaide, and Melbourne.

The fleet is composed of fifty-four vessels, with an aggregate registered tonnage of 234,517, and an effective horsepower of 239,550; speed, 13 to 14 miles per hour.

The vessels are in excellent condition. Every possible protection, and all reasonable comforts and conveniences are supplied. The officers are efficient, courteous, and watchful of the interests of the passengers.

The total distances sailed by this line are: London to Yokohama, 11,956 miles; London to Sydney, 12,500 miles.

American travelers to the Mediterranean and the East will find the most direct route from New York to Gibraltar, Malta, or Naples to be the North German Lloyd Line.

First-class passenger rates and distances between main points.

From London to—	Rate.	Distance.	From London to—	Rate.	Distance.
		Miles.			*Miles.*
Gibraltar	$48.66	1,299	Aden	$199.79	4,965
Marseilles	63.60	1,993	Colombo	255.39	7,058
Naples	68.46	2,272	Albany	292.00	10,448
Malta	78.20	2,280	Melbourne	292.00	11,940
Brindisi	83.00	2,640	Singapore	296.85	8,717
Alexandria	97.33	3,465	Hongkong	361.12	10,154
Port Said	107.00	3,570	Shanghai	361.12	11,024
Bombay	267.66	6,629	Yokohama	361.12	11,950
Calcutta	267.66	8,438	Sydney	340.65	12,500

Rates of freight per ton.

From Malta to—	Rate.	From Malta to—	Rate.
Albany, Adelaide, Melbourne, and Sydney	$24.33	Aden	$14.60
London	8.52	Bombay, Colombo, Calcutta, Penang, Singapore, Hongkong, Shanghia, Hiogo, Nagasaki, and Yokohama	19.46
Gibraltar and Brindisi	5.07		
Port Said	9.73		

The Peninsular and Oriental Company carries the English mails to India, China, and Australia—the India and China mails weekly from Brindisi, to which place they are carried by railroad through France and Italy, the steamers calling at Malta en route to Brindisi every Friday. The mail for Australia leaves London fortnightly, via railroad from Calais to Brindisi, where it is transferred to the Peninsular and Oriental steamers. There is also a fortnightly mail from London to Australia via Naples, thence by steamers.

The contract for carrying the India and China mails is for a period of ten years, from February 1, 1888, to January 31, 1898; the contract for the Australia mail is from February 1, 1888, to January 31, 1895. For these services the company received for the year 1893 (according to the annual report of the secretary to the board of directors), the following amounts:

India and China, net	$1,274,059
Australia, net	413,599
Armed cruisers, etc., subvention	34,467
Total	1,722,125

The Clan Line.—The Clan Line, Limited, and the Clan Line Association are controlled by Cayzer, Irvine & Co., of Glasgow, London, and Liverpool. The termini are London, Calcutta, and Kurrachee. The main points touched are Glasgow, Malta, Port Said, Ismailia, Suez, Aden, Bombay, Calcutta, and Madras. Total distance, London to Calcutta, 7,967 miles.

First-class passenger rates and distances.

From Malta to—	Distance.	Rate.	From Malta to—	Distance.	Rate.
	Miles.			*Miles.*	
London	2,280	$48.65	Bombay	3,992	$172.75
Glasgow	2,608	63.26	Colombo	4,778	172.75
Port Said	935	34.33	Madras	5,388	180.00
Ismailia	979	29.20	Calcutta	6,042	180.00
Suez	1,060	34.06	Kurrachee	3,878	172.75
Aden	2,322	97.33			

The fleet consists of twenty-eight tricompounded Clyde built steamers, and three new vessels in process of construction. The tonnage of the vessels varies from 2,080 to 3,994; they are in good condition and have superior accommodations for first-class passengers.

The service of the Clan Line is divided into three branches:

(1) The Bombay service, performed from Glasgow, via Liverpool, by ten steamers, with an aggregate tonnage of 30,800, calling irregularly at Malta on their outward voyages, but return to London regularly via Malta, making three or four trips per month.

(2) North African service.—The steamers of this service sail from Glasgow, via Liverpool, to Cape Town, Natal Bay, Algoa Bay, East London, and Natal, and occasionally to Delagoa Bay and Mauritius. Eight steamships are employed on this branch (soon to be increased to eleven), with an aggregate tonnage of 24,341 and a carrying capacity of 42,200 tons. They return by the Suez Canal and Malta.

(3) Colombo, Madras, and Calcutta service.—The steamers of this service leave Glasgow and Liverpool punctually every fortnight, via Malta, for Port Said and the Suez Canal. Nine steamers are employed, with an aggregate tonnage of 31,181, and a total carrying capacity of 38,850 tons. They return to London via Malta. The gross tonnage of the fleet is 83,363; it cost upward of $2,500,000. The line employs about 5,000 persons, including officers; and an idea of the magnitude of its operations in the East may be formed by the amount of tolls paid the Suez Canal, which approximates $500,000 a year. Freight rates from Malta to London vary from $4.86 to $6.80 per ton on general cargo, and from $7.30 to $12.50 per ton on costly merchandise. Twenty per cent reduction on return is allowed on first-class passenger rates, available for four to six months. Families of three or more persons, east of Suez Canal, are granted 10 per cent reduction; children over 12 years, full fare; between 3 and 12, half fare; under 3 years, free.

The Deutsche Levant Line.—This line is controlled by a corporation, with headquarters at Hamburg. Termini, Hamburg and Odessa; main points touched, Malta, Piraeus, Syra, Alexandria, Smyrna, Salonica, Constantinople, Varna, Galatz, and Braila.

Distance to principal ports and schedule time of voyage.

From Hamburg to—	Time.	From Hamburg to—	Time.	From Hamburg to—	Time.
	Days.		*Days.*		*Days.*
Odessa	30	Syra	24	Varna	31
Malta	10	Smyrna	25	Braila	32
Piraeus	22	Constantinople	27		
Alexandria	23	Salonica	31		

The fleet is composed of nine steamships, in good condition, which carry from 2,100 to 3,000 tons, departing regularly from Hamburg and Antwerp once a week.

First-class passenger rates from Hamburg.

To—	Rate.	To—	Rate.
Malta	$71.40	Salonica and Constantinople	$83.30
Syra and Piraeus	77.35	Varna	89.30
Alexandria and Smyrna	80.92	Braila and Odessa	95.20

From Antwerp to the above ports, 25 per cent reduction.

First-class passenger rates from Malta.

To—	Rate.	To—	Rate.
Piraeus	$17.00	Varna	$38.93
Alexandria and Smyrna	24.33	Galatz, Braila, and Odessa	48.66
Salonica and Constantinople	29.21		

Return rates allow 60 per cent reduction for adults; 25 per cent for children 2 years of age, and 50 per cent for children over 2 and under 12 years.

Rates of freight vary according to the character of the goods, but, approximately, to Levant ports are quoted at $2.50 to $5 per ton; from Malta to Hamburg, $5 per ton, and from Malta to Antwerp, Rotterdam, Amsterdam, Liverpool, London, Hull, and Glasgow, $6 per ton.

Royal Hungarian Sea Navigation Company (*The "Adria"*).—This line is controlled by a corporation, and operates between Fiume and London, Glasgow, Antwerp, Rouen, Bordeaux, and Malta, monthly and return, with a fleet of twenty-two steamers. Between Malta and Fiume the steamer *Carola* makes fortnightly trips, touching at Syracuse, Catania, Messina, Bari, and Trieste.

Distances from Malta.

To—	Miles.	To—	Miles.	To—	Miles.
Syracuse	85	Messina	155	Trieste	800
Catania	95	Bari	420	Fiume	920

The *Carola* is a new steamer with modern improvements, such as electric light, etc., is in good condition, and has excellent passenger accommodations. Registered tonnage, 889; horsepower, 200; speed, 16 miles per hour.

First-class passenger rates from Malta.

To—	Rate.	To—	Rate.
Syracuse	$4.40	Bari	$11.40
Catania	4.40	Trieste and Fiume	94.00
Messina	5.20		

Freight from Malta to Trieste and Fiume, $3.90 per ton. To intermediate ports, proportionate.

The Transatlantic Line (*Compagnie Générale Transatlantique*).—This line is incorporated and has ramifications from London and Paris to various parts of the world. Its Mediterranean line employs twenty-four vessels, of a tonnage from 1,208 to 2,656, and a horsepower of 1,100 to 3,800. Weekly trips are made from Marseilles to Tunis, via Malta, and return.

First-class passenger rates.

From—	To—	Rate.	From—	To—	Rate.
Marseilles	Tripoli	$42.80	Malta	Tunis	$10.70
Do	Tunis	24.43	Do	Tripoli	9.75
Do	Malta	37.00			

Distances.

From—	To—	Miles.
Marseilles	Tunis	1,384
Do	Malta	704
Malta	Tunis	680

Freight rates.

From Malta to—	Rate per ton.
Marseilles	$1.93 to $9.65
Tripoli	1.55 to 9.65
Tunis	1.55 to 9.65

Freight rates are governed by the nature, quantity, etc., of the shipments.

The Wilson Line.—The business of this line is controlled by Thomas Wilson, Sons & Co., who operate an extensive system of ocean transportation, devoted mostly to cargo business, from Hull and London to New York and Boston, Hamburg, Bremen, India, and Australia. Its Mediterranean service operates a fleet of twenty-seven steamships (1,113 to 3,212 tons each), all of which are in good condition. They call

at Malta about every twenty-one days. The termini are Hull and London and Alexandria and Odessa. The intermediate ports are Messina, Marseilles, Genoa, Leghorn, Naples, Malta, and Constantinople.

Distances and first-class passenger rates.

From Hull to—	Miles.	Rates.
Odessa	3,600	$104.86
Messina	2,393	58.46
Palermo	2,364	58.40
Trieste and Venice	3,164	77.85
Marseilles	2,230	68.13
Genoa	2,400	68.13
Leghorn	2,438	68.13
Naples	2,440	58.40
Constantinople	3,264	73.86
Alexandria	3,274	73.00
Malta	2,490	58.40

Freight, general cargo, ranges from $3.65 to $7.30 per ton.

The Papayanni Steamship Company.—This steamship line is controlled by a corporation, and operates between Liverpool and Odessa. The vessels touch at Gibraltar, Algiers, Malta, Alexandria, Cairo, Limasol, and Constantinople. Total distance between termini, 3,335 miles.

Distances from Liverpool.

To—	Miles.	To—	Miles.	To—	Miles.
Gibralta	1,250	Constantinople	3,015	Alexandria	3,027
Malta	2,240	Algiers	1,665	Smyrna	2,870
Syra	2,769				

First-class passenger rates from Malta.

To—	Rate.	To—	Rate.
Liverpool and Odessa	$48.66	Limasol	$39.93
Smyrna, Alexandria, and Algiers	24.33	Syra	17.00
Gibraltar and Beyrouth	29.20		

Freight rates to the East are $3.65 per ton and 5 per cent primage, and to Liverpool $7.30 per ton.

The Leyland Steamship Line.—This line is controlled by a corporation. The termini are Liverpool and Odessa, a distance of 3,335 miles. The main points touched are Gibraltar, Malta, Alexandria, Syra, Smyrna, and Constantinople.

Distances from Liverpool.

To—	Miles.	To—	Miles.	To—	Miles.
Gibraltar	1,250	Alexandria	3,027	Smyrna	2,870
Malta	2,240	Syra	2,769	Constantinople	3,015

The fleet is composed of thirteen steamships, 301 to 361 feet in length and of 1,010 to 1,453 tons. Carries cargo only. Freight rates to the East are $3.64 per ton and 5 per cent primage, and to Liverpool $7.30 per ton.

The Cunard Steamship Line, Levant fleet.—This line is operated and controlled by a corporation, and carries no first-class passengers. The termini are Liverpool and Constantinople, and the main points touched are Gibraltar, Malta, Syra, Smyrna, and sometimes Alexandria.

Distances from Liverpool.

To—	Miles.	To—	Miles.	To—	Miles.
Constantinople	3,015	Smyrna	2,870	Syra	2,769
Malta	2,240	Gibraltar	1,250	Alexandria	3,027

The Levant fleet consists of two vessels, one of 1,000 tons and 170 feet in length; the other of 1,400 tons and 300 feet in length. Leave Liverpool every three weeks. Freight rates for Syra, Smyrna, and Constantinople range from $2.50 to $3.75 per ton, and to Gibraltar and Liverpool from $5 to $7.50 per ton.

The Moss Steamship Company.—This line is controlled by a limited corporation. The termini are Liverpool and Constantinople, and the main points touched are Gibraltar, Algiers, Malta, Alexandria, Syra, and Smyrna.

Distances.

From—	To—	Miles.	From—	To—	Miles.
Liverpool	Malta	2,240	Liverpool	Gibraltar	1,278
Gibraltar	Algiers	410	Malta	Alexandria	817
Algiers	Malta	583	Syra	Smyrna	174
Malta	Syra	529	Smyrna	Constantinople	296
Liverpool	Constantinople	3,015			

The fleet consists of fourteen vessels of 2,250 to 3,000 tons, in good condition, which make weekly trips.

First-class passenger rates from Malta.

To—	Rate.	To—	Rate.
Liverpool	$48.65	Syra	$17.00
Algiers, Smyrna, and Alexandria	24.33	Gibraltar and Constantinople	29.20

Freight from Malta to Liverpool is $5 per ton.

The City Line.—This line is controlled by a limited corporation. Liverpool and Calcutta are the termini, and Malta, Port Said, Bombay, and Kurrachee the principal intermediate points.

Distances from Liverpool.

To—	Miles.	To—	Miles.	To—	Miles.
Calcutta	7,917	Malta	2,240	Bombay	6,225
Gibraltar	1,250	Port Said	3,290	Kurrachee	6,035

The fleet is composed of seventeen steamships, 361 to 412 feet in length and from 2,102 to 2,933 tons. The vessels are in good condition and make fortnightly trips.

First-class passenger rates from Liverpool.

To—	Rate.	To—	Rate.
Malta	$48.66	Ismailia	$73.00
Port Said	68.13	Calcutta, Bombay, and Kurrachee	219.00

Freight from Liverpool to Malta, $4.86 per ton; return, one-fourth off.

Italian General Navigation and Florio-Rubattino Company.—This line is controlled by a corporation with its principal offices at Rome and Naples. It operates a number of lines in the Mediterranean.

The line between Malta, Naples, and Genoa touches at Syracuse, Catania, Reggio, and Messina. The service is supplied with twelve vessels (900 to 1,500 tons), which make weekly trips. First-class passenger rates from Malta to Genoa, $30.45, and about the same to other points and returning. Freight rates are as follows: First class, $10 per ton; second class, $8; third class, $6; fourth class, $3.

The Westcott Line.—This line is controlled by Westcott & Lawrence, London. The service is divided into three branches, viz:

(1) For Alexandria and Batoum; from Antwerp and London, touching at Malta, Smyrna, and Constantinople, taking freight, by transshipment, for Tunis, Tripoli, Larnaca, Limasol (Cyprus), Alexandretta, Mersine, Beyrouth, Gallipoli, Dardanelles, Ismeed, Dede Agatch, Ragos, Kavalla, Mitylene, Scio, Kustendji, and Poti.

Distances in miles.

From—	To—					
	London.	Malta.	Alexandria.	Smyrna.	Constantinople.	Batoum.
Antwerp	259	2,370	3,295	3,215	3,545	4,300
London	.....	2,315	3,240	3,160	3,490	4,245
Malta	.....	.....	925	845	1,175	1,930
Alexandria	.....	.....	.....	625	985	1,740
Smyrna	.....	.....	.....	.....	360	1,115
Constantinople	.....	.....	.....	.....	.....	755

(2) The Danube line, between Antwerp, London, and Ibrail, touching at Malta, Piraeus, Syra, Constantinople, and Galatz, taking goods, by transshipment, for Tunis, Tripoli, Valo, Calamota, Katacolo, Patras, Corfu, Zante, Gallipoli, Dardanelles, Ismeed, Dede Agatch, Lagos,

Kavalla, Myteline, Scio, Kustendji, Trebizonde, Rodosto, Ineboli, Samsoun, Kerasunde, and Tultcha.

Distances in miles.

From—	To—						
	London.	Malta.	Piraeus.	Syra.	Constantinople.	Galatz.	Ibrail.
Antwerp	259	2,370	3,020	3,020	3,545	3,990	4,015
London	.....	2,315	2,965	2,965	3,490	2,935	3,960
Malta	.....	.....	650	650	1,175	1,620	1,645
Piraeus	.....	.....	.....	60	460	905	930
Syra	.....	.....	.....	.....	400	845	870
Constantinople	.....	.....	.....	.....	.....	445	470
Galatz	.....	.....	.....	.....	.....	.....	25

(3) The Odessa line, from London and Antwerp to Odessa, touching at Malta, Constantinople, Bourgas, and Varna, taking goods by transshipment, for Tunis, Tripoli, Valo, Calamota, Katacolo, Patras, Corfu, Zante, Gallipoli, Dardanelles, Ismeed, Dede Agatch, Kavalla, Mitylene, Scio, Kustendji, Trebizonde, Rodosto, Ineboli, Samsoun, Kerasoon, and Poli.

Distances in miles.

From—	To—					
	London.	Malta.	Constantinople.	Bourgas.	Varna.	Odessa.
Antwerp	259	2,370	3,545	3,695	3,795	4,147
London	.....	2,315	3,490	3,640	3,740	4,092
Malta	.....	.....	1,175	1,325	1,425	1,777
Constantinople	.....	.....	.....	150	250	602
Bourgas	.....	.....	.....	.....	100	450
Varna	.....	.....	.....	.....	.....	352

The services of the respective branches are performed by a fleet of nine steamships, varying in length from 241 to 316 feet, and in registered tonnage from 867 to 1,278. The ships are in good condition; they call at Malta about every ten days.

First-class passenger and freight rates from Malta.

To—	Passenger.	Freight per ton.	To—	Passenger.	Freight per ton.
Piraeus and Syra	$14.60	$3.89	Bourgas, Galatz, Ibrail, and Varna	$29.20	$6.07
Alexandria	24.33	3.89	Batoum and Odessa	34.00	6.07
Constantinople and Smyrna	24.33	4.86			

O. F. Gollcher & Sons' Line is controlled by the proprietors. The fleet consists of two well-conditioned steamships, with registered tonnage of 139 and 539 and length of 140 and 200 feet, respectively. There are no accommodations for first-class passengers. The termini are Malta and Trieste; main points touched, Syracuse, Catania, and Tunis.

Distances in miles.

From—	To—			
	Syracuse.	Catania.	Trieste.	Tunis.
Malta	100	145	1,020	310
Syracuse	.....	45	925	.....
Catania	.....	.....	880	.....

Freight rates per ton are as follows: From Malta to Catania and Syracuse, $1.94; to Tunis and Trieste, $2.92.

The foregoing includes all regular lines of ocean steamships that "carry passengers, through mails, or freight in very considerable quantities" in this consular district.

RAILROADS AND HIGHWAYS.

There are no railroads in this district, except a local line from Valletta to Civita Vecchia, a distance of 8 miles, operated by the Maltese Government, and serving the purpose of a street railway. Neither are there any navigable rivers or canals or highways, as such, only stradas (roads) leading from Valletta to the different villages on the island.

ACKNOWLEDGMENTS.

In the absence of commercial and navigation statistics at this port, I am under obligation to Hon. F. Vella, collector of the port, and to the agents of the respective ship companies for valued assistance.

D. C. KENNEDY,
Consul.

MALTA, *August 1, 1894.*

GREECE.

OCEAN LINES.

The Panhellenic Steam Navigation Line.—This is the only great through line owned in this country. It is a private corporation with a capital of 5,000,000 drachmas ($965,000). The fleet consists of the following vessels: Three steamships of 300 tons each and 2,000 horsepower; three steamships of 1,800 tons each and 1,750 horsepower; and six coasting steamers of about 800 tons each and 400 horsepower.

The three first named keep up fortnightly communications with Piraeus, Marseilles, Chios, Smyrna, Constantinople, Samsoun, Trebizonde, and Novorisisk, carrying mails, passengers, and cargo. No fixed rates for either passengers or cargo can be given, as these vary in accordance with the competition of foreign lines.

The second three steamers of this line run fortnightly to and from Piraeus, Smyrna, Chios, Mytelene, Constantinople, Samsoun, and Trebizonde. On returning to Piraeus, the steamers make trips to and from Calamata, Patras, Corfu, and Trieste. Rates of passage and freight can not be given for reasons stated above. The competition with this line is very great, owing to the number of foreign ships trading to the same ports. The remaining six vessels of the company do a local coasting trade, and have daily sailings for coast towns and the islands of Greece.

The condition of the first named six steamers of this line is considered fairly good for mixed cargo and passenger vessels, although not comparable with the first-class lines trading to the United States, or to the Messageries Maritimes, the Austrian Lloyds, or the Russian Steam Navigation Company, trading in the Mediterranean and Black seas. The speed of the steamers of the Panhellenic Line is on an average 10 knots per hour.

Foreign lines.—The foreign lines are the Messageries Maritimes (French); the Fraissinet (French); the Austrian Lloyds; the Florio-Rubattino (Italian); the Khedive (Egyptian); and the Russian Steam Navigation Company. All these lines have sailings from Piraeus to the ports touched by the Panhellenic steamers.

Coastwise lines.—The New Hellenic Company is a private corporation, with headquarters at Syra. This company has six steamships of 900 tons each and 400 horsepower, and four steamships of 400 tons each and 150 horsepower.

The Goudé Steamship Company is also a private corporation. The company has five steamships of from 190 to 600 tons and 60 to 300 horsepower.

The McDowall & Barbour Hellenic Steamship Company is composed of five steamships of 200 to 800 tons and 100 to 250 horsepower.

Besides the foregoing, there are several small steamers of less than 100 tons and 100 horsepower doing a local trade between several of the islands and ports on the mainland.

RAILWAYS.

The railways in Greece are of local importance only, if we except the line to Patras from Piraeus, which has the carrying of the European mails to and from Patras to Athens and Piraeus. This line is called the Piraeus, Athens and Peloponese Railway, and is a private corporation, with a capital subscribed and paid up of 25,000,000 drachmas ($4,825,000). It is a single-track road, 1 meter (39.37 inches) gauge, and connects Piraeus with Athens, Corinth (crossing the Corinth Canal by high bridges), Kiato, Vostizza, and Patras. Passenger trains run this distance twice daily each way. From Patras the line runs to Pyrgos, Olympia, Catacolo, and Cyllene. Cyllene is famous for its baths, which cure bronchial diseases. The company

has here erected baths and fairly good hotels for the use of patients. Another branch of the line, from Corinth, runs to Argos, Nauplia, and Mycene; from Nauplia to Mylos, and thence to Tripolitza. The Mylos-Tripolitza section was to be continued through the Peloponnesus to Calamata, but the contracting company failed, and the line remains unfinished. A small part on the Calamata side is worked at present as far as the village of Diavolitsa.

The following are the distances and fares charged:

From—	To—	Distance.	Fare.
		Miles.	
Piraeus	Corinth	62.14	$1.78
Corinth	Patras	80.78	3.18
Do	Nauplia	40.02	1.56
Nauplia	Tripolitza	49.96	1.95

The total length of the Piraeus, Athens and Peloponese Railway is 353 miles.

The Athens and Piraeus Railway is the oldest, shortest, and busiest in the Kingdom. It is double track, broad gauge (4.91 feet), extending from Athens, via Phalerum, to Piraeus, 6.2 miles. The fare from Piraeus to Athens is 19.3 cents, and from Athens to Phalerum, 11½ cents. It is a private corporation, and carries no freight.

The Railway of Attica, built and operated by the Laurium Mining Company, is a single-track, narrow-gauge road, connecting Athens with Laurium, and by a branch line with Kephissia. The company was formed in 1882, and the road was completed in 1885. Its capital is $1,042,200, in 27,000 shares. It has 76 kilometers (47.22 miles) of track, which cost $965,000 to construct. It has 19 stations, 196 bridges, 131 curves, 42 passenger carriages, 46 freight cars, 8 engines, and employs 115 men. It runs 6,462 regular and 328 special trains per year. In six years its passenger traffic has nearly doubled. It now carries 351,567 persons in a year, and its freight tonnage has increased nearly sixfold, from 3,000 to 17,128 tons. It is the carrier of the entire traffic of the most important mining district in Greece, as well as the richest plains of Attica. From the mines of Daskalio it carries to Laurium 115,000 tons of iron ore, and from the two villages of Markopoulo and Koropi to Athens 1,200 barrels of must, annually. The company has contracted for another branch to connect Athens with the marble quarries of Pentelicus. The fare from Athens to Laurium is $1.42.

Thessalian railways.—The line from Volo to Larissa, Karditsa, and Kalambaca is owned by a private corporation, and is single track, 1 meter (39.37 inches) gauge, and 127 miles in length. Fare from Volo to Larissa, $2.39.

A single-track line also connects Missolonghi with Agrinion. At present this is only of local importance. Length, 27.38 miles.

Piraeus and Larrissa Railway.—About three years ago, a contract was made between the Greek Government and a British company to

construct a line, single track, for the State, between Piraeus and Larissa, with a branch from Lamia to Stylida and Chalcis. The work of construction proceeded fairly for about a year or eighteen months, when financial trouble overtook the State, and the contractors abandoned the work. The line remains in a half-finished condition, no part of it having been yet opened to traffic, although about $3,860,000 has been expended on it.

HIGHWAYS.

Fairly good macadamized roads exist throughout Greece, connecting the principal towns and villages. The width of these roads varies from 30 feet, near Athens and Piraeus, to 20 feet, and 12 feet in the provinces, according to the density of traffic over them.

CANALS.

The only canal in Greece is that through the Isthmus of Corinth, which was lately opened for traffic,[1] but up to this time it has only been used to a small extent by local coasting steamers of small tonnage.

GEORGE HORTON,
Consul.

ATHENS, *January 1, 1895.*

TURKEY.

Constantinople, the capital and commercial center of the Ottoman Empire, is connected by rail with western Europe and Asia Minor, and by steamer with Liverpool, London, Antwerp, Hamburg, and with all the principal ports of both the Black and Mediterranean seas.

By reason of new railroads and increased steamer service, Turkey is much more accessible than in former years, and the modes of travel are quite safe and convenient. The railway time tables change so often, and the steamers are so numerous and changeable, both as to time, departure of and prices, that it is impossible to give more than general information without extending this report beyond proper limits.

RAILWAYS.

The railways in European Turkey are operated by the Oriental Railway Company which is controlled by Austrian capital. That part of the main line in Turkey extends from Constantinople to Mustapha Pasha, on the Bulgarian frontier, 220 miles, and connects the capital with western Europe, via Vienna. At Adrianople, a branch line leads to Dede Agatch, on the Ægean Sea, and is now being continued along

[1] See Consular Reports for November, 1893, No. 158, p. 308.

the coast to Salonica. There is another line from Salonica to Varanya, in Servia (280 miles), where it connects with the main line for Vienna. In Asia Minor, the Anatolian Railway, constructed by a German company, extends from Haidas Pasha (a suburb of Constantinople), on the Asiatic shore of the Bosphorus, to Angora, a distance of 370 miles, with a branch line from Eski Shehr to Kutaieh. All these roads are single track, but reasonably well built and kept in fair condition.

A daily express train leaves Constantinople for Vienna, where close connection is made with trains for the principal cities of Europe. In addition to this, the Orient Express, composed of sleeping and dining cars only, runs, biweekly, each way, without change, between Paris and Constantinople, via Vienna. The fare on this train, including a sleeping berth, is about one-fourth higher than the regular first-class rate.

The following table gives the first-class rate for passengers and freight per ton from Constantinople to the cities named:

Constantinople to—	Passengers.	Freight.	Constantinople to—	Passengers.	Freight.
Adrianople	$9.48	$8.91	London	$83.00	$104.22
Angora	16.15	12.42	Munich	48.17	45.81
Belgrade	29.88	29.43	Paris	68.52	78.12
Budapest	33.91	35.01	Philippopolis	14.82	14.67
Berlin	52.86	49.41	Sofia	18.78	18.36
Eski Shehr	8.37	12.34	Vienna	38.28	39.06
Ismeed	1.63	3.60			

OCEAN LINES.

The Khedive Mail.—This line of fast steamers is owned by an Egyptian company. A vessel leaves Constantinople every Wednesday afternoon for Alexandria. These vessels are first-class, and run, in connection with the Orient Express carrying the European mails for Egypt and India, from Constantinople to Alexandria in fifty-one hours.

Austrian Lloyds.—This line, controlled by an Austrian company, has seventy-two steamers, one-third of which are modern, and furnish very good accommodation for travelers. The company has lines as follows, leaving Constantinople weekly: (1) To Trieste, via Piraeus, Corfu, and Brindisi; (2) to Alexandria, via Smyrna, Beirut, and Jaffa; (3) to Varna, on the Black Sea; (4) to Batoum, via Samsoun and Trebizonde; (5) to Galatz, via Bourgas; (6) a line fortnightly to Trieste, via Salonica.

Russian Company of Navigation and Commerce.—This line is owned by a Russian company and runs (1) to Alexandria direct; (2) to Alexandria, touching along the Syrian coast one week and Athens the next; leaves once a week; (3) to Odessa, on the Black Sea, twice a week. This company has a large and well-fitted fleet. Some of the vessels belonging to the volunteer reserve fleet are over 8,000 tons.

Messageries Maritimes.—A French company with a very large fleet, built, most of them, with the latest improvements; running from Constantinople (1) to Marseilles, via Dardanelles, Syra, and Calamata; (2)

to Marseilles, via Dardanelles, Smyrna, and Piraeus; (3) to Batoum, via Samsoun, Kerasoon, and Trebizonde; (4) to Odessa. Departure once a week; date varies. Freight varies between $3 and $3.40 to Marseilles per ton.

Fraissinet & Co.—This French line has a large fleet, the gross tonnage of which is between 1,500 and 3,000. Runs from Constantinople (1) to Marseilles, via Smyrna, fortnightly; (2) to Marseilles, via Dede Agatch, Salonica, Piraeus, fortnightly; alternate weeks.

Paquet & Co.—A French line running once a week to Marseilles direct; very small vessels, and principally used for carrying freight.

Navigazione Generale Italiana.—An Italian line of mail steamers, with a fleet of 105 vessels; gross tonnage from 500 to 4,500; running from Constantinople (1) to Naples, via Piraeus; (2) to Brindisi, via Piraeus, Patras, and Corfu; (3) to Odessa.

Panhellenic Company.—A Greek line carrying mail and having a fleet of nine vessels. Gross tonnage, 500 to 3,000. Runs weekly from Constantinople (1) to Athens, Itrusto, and Marseilles; (2) to Batoum, via Samsoun; (3) to Smyrna and Athens.

Turkish lines.—A Turkish company having a small fleet of steamers, gross tonnage from 500 to 3,000, does the coasting trade between Constantinople, the Black Sea, Sea of Marmora, and the Syrian coast; also the Barbary coast service. Departures, once or twice a week for distant ports; daily for the Sea of Marmora.

Another Turkish line connects Constantinople with the Syrian coast, the Grecian islands, and the Turkish islands of the Grecian archipelago. The fleet is small, and few of the steamers have accommodations for travelers.

English lines.—All the English lines leave Constantinople for Liverpool or London, touching at Smyrna, Malta, or Gibraltar. They have a tonnage of from 3,000 to 7,000 tons. The following are some of the most important:

Regular lines of British steamers between Constantinople and other ports.

Lines.	Number of vessels.	Average horse-power.	Average net tonnage.	Sailings.	From—
Papayanni	6	300	1,500	Fortnightly	Liverpool.
Cunard	6	280	1,400	do	Do.
Moss	6	250	1,200	do	Do.
Leyland	6	260	1,200	do	Do.
Wilson	10	300	1,600	do	Hull.
Johnston's	7	220	1,200	Weekly	Constantinople, Odessa, and Marseilles.
Westcott & Lawrence	8	200	1,000	Fortnightly	London.
John P. Best & Co	7	200	1,100	do	Antwerp.

Passenger and freight rates.

Constantinople to—	First-class passenger rates.	Freight per ton.	Constantinople to—	First-class passenger rates.	Freight per ton.
Alexandria	$38.60	$6.93	Liverpool	$70.00	$11.00
Athens	15.44	3.42	London	57.90	7.50
Antwerp	77.20	26.01	Marseilles:		
Batoum:			French	43.42	6.93
Austrian	27.02	3.42	Italian	38.60	
French	23.16		Naples	51.72	17.37
Russian	28.56		Odessa	15.44	2.61
Beirut	53.07	5.13	Smyrna	11.58	3.42
Brindisi:			Salonica:		
Austrian	47.76	17.37	Italian	17.94	1.71
Italian	42.26		Austrian	20.74	
Dardanelles	6.75	1.26	Sebastopol	15.44	6.93
Genoa	64.92	17.37	Trieste	71.10	6.93
Hamburg	77.20	26.01	Trebizonde	26.53	3.42
Jaffa	60.60	5.13	Varna	8.62	1.71

LUTHER SHORT,
Consul-General.

CONSTANTINOPLE, *April 3, 1895.*

BULGARIA.[1]

RAILWAY DEVELOPMENT.

In 1892, the Bulgarian Government contracted with the Austrian Land Bank for a loan of 125,000,000 francs ($24,125,000) for the completion of the railway system in the principality and the construction of new harbors at Varno and Burgas.

It has now been decided by the council of ministers to begin the construction of the following lines:

(1) Sofia-Roman, a distance of 109 kilometers (67.73 miles), at a cost of 22,000,000 francs ($4,246,000).

(2) Roman-Plevna-Polikranishte-Shumla, 333 kilometers (207 miles), at a cost of 25,000,000 francs ($4,825,000).

(3) Polikranishte-Tirnovo-Nova-Zagora, 110 kilometers (68.3 miles), at a cost of 16,500,000 francs ($3,184,500).

(4) Polikranishte-Roustchouk, 105 kilometers (65 miles), at a cost of 9,500,000 francs ($1,833,500).

(5) Gabrovo-Selvi, to a point on the central line, 70 kilometers (43½ miles), at a cost of 6,000,000 francs ($1,158,000).

In addition to these, the following lines have been proposed, and will be built soon after the completion of the above-named lines:

(1) Pernik, south of the Turkish frontier, 80 kilometers (49.7 miles), at a cost of 9,000,000 francs ($1,737,000).

---

[1] Extract from a report by Consul Stephan, of Annaberg, dated April 13, 1895, printed in Consular Reports for August, 1895.

(2) Mesdra-Wratza-Widdin, 130 kilometers (80.8 miles), at a cost of 8,450,000 francs ($1,630,850).

(3) Philippopolis Karlofer-Kasanlyk-Nicolaevo, 139 kilometers (86.4 miles), at a cost of 7,645,000 francs ($1,475,485).

RUSSIA.

ST. PETERSBURG.

The following report is confined to those highways of traffic in European Russia of which St. Petersburg is actually the starting point, and which serve to give that city direct communication with different parts of the Empire.

OCEAN LINES.

St. Petersburg has no great through lines of ocean traffic, but coastwise steamship lines connect the capital with the other important ports on the Russian coast of the Baltic Sea, and with Stockholm. Steamship communication with English ports, principally with Hull and London, is irregular, there being no direct line of steamers between St. Petersburg and any port of western Europe.

(1) Steamers run from St. Petersburg to Helsingfors, Abo, and Torneo three times a week. The passenger fare, first class, to Helsingfors, is 8 rubles; to Abo, 11 rubles; and to Torneo, 16.30 rubles, with 100 pounds of passenger baggage free.

(2) Steamers run from St. Petersburg to Reval and Riga twice a week, the first-class fare to Reval being 6 rubles, and to Riga 12 rubles, with 100 pounds of passenger baggage free.

FREIGHT RATES.

Freight rates are strictly classified, and there is a great difference between the several classes of freight, as will be seen by the following table of through rates between St. Petersburg and Riga:

Articles.	Per pood. *a*	Per ton.
	Kopecks. b	
Pig iron, nails, flour, pease, soap, and tallow candles	8	$2.55
Potash, stearine candles, cardboard, tin plate, potatoes	10	3.19
Writing paper, peeled barley, groats, rice, starch, tallow, oil, sirup, oleine, white lead, faience	12	3.82
Books, wall paper, window glass, sail cloth, scythes, dyewoods, and dye materials, seed, wine, whisky, leaf tobacco, and sugar	15	4.78
Wool, leather, smoking tobacco, cigars, manufactures, leather goods, rubber goods, fruits, and corks	25	7.97
Colonial goods, ironware, and raw hides	20	6.38
Papyrus, glassware, and arms	30	9.57
Drugs, plants, and smokers' articles	40	12.96

a 1 pood = 36.112 pounds.

b 1 kopeck = $\frac{1}{100}$ of a ruble. The consul-general, in his reductions throughout his report, estimates the paper ruble at 50 cents.

RIVER AND CANAL LINES.

There is no passenger steamboat line from St. Petersburg to the interior of Russia. Freight is carried by river and canal craft as far as Tver or Rybinsk, on the Volga River. Tver is the head of steamship navigation on the Volga. Passengers from St. Petersburg desiring to use the Volga steamboats usually go by rail to Rybinsk. From Tver to Astrakhan, at the mouth of the Volga, the distance is nearly 2,000 miles.

(1) From Tver to Rybinsk, a distance of 245 miles, steamboats run daily, the passenger fare, first class, being 7.50 rubles, or about $3.75. On this line there is one passenger steamer of 42 horsepower, 140 feet in length and 21 feet in width. Besides this steamer, there are three passenger and freight steamers of 165 horsepower, the largest being 187 feet in length and 24 feet in width.

(2) From Rybinsk to Nizhni-Novgorod, a distance of 307 miles, steamboats run twice a day, first-class fare being 6 rubles, or about $3. The time occupied in the passage downstream is twenty-nine hours, and upstream forty-four hours. The number of passenger steamers on this line is 17, with a total horsepower of 828, the largest having 80 horsepower, with a length of 217 feet and a width of 31 feet. The number of freight and passenger steamers is 18, with a total horsepower of 1,322, the largest having 120 horsepower, with a length of 224 feet and a width of 37 feet. There are also 4 passenger steam tugs, with a total horsepower of 215, the largest having 120 horsepower, and 124 freight steam tugs, with a total horsepower of 12,258, the largest having 460 horsepower.

(3) From Nizhni-Novgorod to Astrakhan, a distance of 1,443 miles, steamboats run daily, the time occupied in the trip downstream being about 150 hours, and upstream 230 hours. The through fare, first class, is 23.50 rubles, or about $12.

The last official publication (1893) relating to the traffic between Nizhni-Novgorod and the mouth of the Kama River and between the mouth of the Kama and Astrakhan gives the following statistics:

Nizhni-Novgorod to mouth of the Kama.

Vessels.	Number.	Horse-power.
Passenger steamers	5	77
Passenger and freight steamers	4	158
Passenger steam tugs	7	227
Freight tugs	58	1,926

The largest passenger steamers have 500 horsepower each, being 287 feet in length and 35 feet in width. The largest freight steamers have 400 horsepower, with a length of 285 feet and a width of 40 feet.

Mouth of the Kama to Astrakhan.

Vessels.	Number.	Horse-power.
Passenger steamers	20	2,537
Freight and passenger steamers	34	6,045
Passenger steam tugs	6	295
Freight tugs	71	4,774

The largest freight steamers have only 120 horsepower, their length being 200 feet and their width 19 feet. The largest passenger steamers have only 40 horsepower, with a length of 110 feet and a width of 15 feet.

Although these figures were published in 1893 they represent the state of things as it existed in 1891, since which time there has been considerable increase in the number of steam craft on the Volga, an increase probably amounting to one-fourth of the figures given.

From Nizhni-Novgorod there is also a regular steamboat line for passengers and freight to Perm, on the Kama River, a distance of 1,488 versts.[1] The first-class fare is 13 rubles, and the time occupied in the trip to Perm, three and a half days, and from Perm to Nizhni-Novgorod, three days.

The freight rates on the Volga fluctuate according to the amount of business and the state of the water. The most recent official publication gives the freight on breadstuffs as follows: Going upstream, 1.253 kopecks[2] per pood per verst, or about one-sixth cent per ton per mile, and downstream a little less; above Rybinsk, by means of horse towing upstream, 1.73 kopecks per pood per verst; on the Kama, by means of steam tugs downstream, 1.242 kopecks per pood per verst.

RAILWAYS.

The real center of the railway system in the Russian Empire is the city of Moscow, on account of its geographical location.

Leading from St. Petersburg in different directions there are four through lines of railway, viz: (1) The St. Petersburg-Moscow-Nizhni-Novgorod Railroad, called the Nicholaevsk line; (2) the St. Petersburg-Warsaw Railroad; (3) the Baltic Railroad; (4) the St. Petersburg-Helsingfors Railroad, also called the Finland Railroad. The first three lines of railroad are controlled by the Government; the last line by a private company.

TERMINI AND MAIN POINTS.

The termini of the above lines of railroad are partly indicated by their names. (1) The termini are St. Petersburg and Nizhni-Novgorod, at which latter place the road communicates with steamship navi-

[1] 1 verst = 0.663 mile.

[2] The kopeck, according to the consul-general's valuation, equals one-half of a cent.

gation down the Volga River as far as Astrakhan and the Caspian Sea, and also up the Kama River, a tributary of the Volga, as far as the city of Perm, the starting point of the Ural Railroad. (2) The termini are St. Petersburg and Warsaw, connecting at the latter place with the Warsaw and Vienna Railroad. (3) The termini are St. Petersburg and Riga, with a branch to Baltic Port on the Gulf of Finland. (4) The termini are St. Petersburg and Helsingfors, connecting at Rikhimiaki with a railroad line to Nicholaistadt.

The total length of the St. Petersburg-Nizhni-Novgorod line is 1,035 versts, or 686.205 miles. The main points touched by this line, beginning at St. Petersburg, with the distances between them, are: Chudovo, 73 miles; Medvedevo, 126 miles (from which point a line of railway 185 miles long runs to Rybinsk, connecting with steam navigation on the Volga); Ostashkovo, 76 miles (from which point a railroad line leads to Rzhev, 63 miles distant); Tver, 26 miles; Moscow, 104 miles; Vladimir, 117 miles; Kovrov, 43 miles (with a line of railroad 67 miles long running to Mourom on the Oka); Nizhni-Novgorod, 125 miles.

The total length of the St. Petersburg-Warsaw line (with a branch to Virballen, by way of Kovno, a little over 100 miles long) is 800.241 miles. The main points touched, starting from St. Petersburg, with the distances between them, are: Gatchino, 28 miles; Pskov, 142 miles; Dvinsk, or Dunaburg, 160 miles; Vileika, 102 miles (from which point a great line of railroad, controlled by the Government, leads to the Azov Sea); Vilno, 6 miles (with a Government line of railroad branching to Rovno, 320 miles distant); Grodno, 98 miles; Belostok, 52 miles, and Warsaw, 108 miles.

The distance from St. Petersburg to Virballen, on the Prussian frontier, is 540 miles. From the station of Koshedary, on the Virballen branch, a line of railroad leads off to Libau, 190 miles distant. Libau is now the most important port on the Baltic, being open for navigation during the whole year. At Dvinsk the St. Petersburg-Warsaw Railway is crossed by the great connected line of railroads from Riga, via Vitebsk and Orel, to Tsaritsine on the lower Volga.

The total length of the Baltic Railroad, with its several branches, is 568 versts, or 376.584 miles. The main points touched, starting from St. Petersburg, with the distances between them, are: Narva, nearly 100 miles; Taps, 82 miles; Reval, 48 miles; Baltic Port, 30 miles; Juriev, or Dorpat, 70 miles from Taps; Walk, 52 miles; Riga, 112 miles; Pskov, 90 miles from Walk. Riga is connected with the Libau Railway by a line 85 miles long, running through Mitau.

The total length of the Finland line is 425 versts, or 281.775 miles. The main points, starting from St. Petersburg, with the distances between them, are: Wiborg, 82 miles; Rekhimiaki, 155 miles; Helsingfors, 46 miles.

NUMBER OF TRACKS.

Of the above-mentioned roads, the lines having double tracks are those from St. Petersburg to Moscow and from St. Petersburg to Warsaw. On the Finland line a double track is laid only from St. Petersburg to Belo Ostrov, and on the Baltic line from St. Petersburg to Gatchino. There is now a law in Russia which provides for the laying of a double track whenever the gross income on any railroad line reaches the sum of 9,000 rubles a year per verst.

FREQUENCY OF COMMUNICATION.

There are six daily passenger trains from St. Petersburg to Moscow, two from Moscow to Nizhni-Novgorod, three to Reval, one to Riga, two to Helsingfors, and three to Warsaw and Virballen.

PASSENGER RATES.

Passenger cars are of three classes, the fare being 3 kopecks (1½ cents) per verst (0.663 mile) in the first class, 2½ in the second, and 1¼ in the third in ordinary passenger trains; but there is a Government tax on railroad tickets, amounting to 25 per cent on tickets of the first class and 15 per cent on tickets of the second class, tickets of the third class being free, which tax is always added to the fare. One pood, or 36 pounds, of passenger baggage goes free. The excess is subject to a charge of 1 kopeck (½ cent) per 10 pounds for every 16 versts, or a little over 10 miles. The passenger fare on fast trains (kourierski poezd) and mail trains (pochtovyi) is somewhat higher.

The traveling public of the well-to-do class and tourists generally ride in the second class.

The following tables show the passenger fare in the first and second classes between the terminal points and the more important intermediate stations, in Russian currency, which is fluctuating in value; but the traveler will not go far astray if he considers the ruble (100 kopecks) equal to 50 cents in American money; hence, 1 kopeck is one-half of a cent.

Special passenger trains.

From St. Petersburg to—	First class.			Second class.	
	Fast trains.	Mail trains.	Passenger trains.	Mail trains.	Passenger trains.
	Rubles.	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*
Chudovo	.....	4.16	3.82	3.13	2.78
Ostashkovo	.....	15.30	14.03	11.48	10.00
Tver	22.40	16.80	15.40	12.60	10.00
Moscow	30.20	22.65	20.76	16.99	13.21
Nizhni Novgorod	.....	.....	39.13	.....	27.69

General passenger trains.

Stations.	First class.	Second class.	Stations.	First class.	Second class.
Moscow to—	*Rubles.*	*Rubles.*	St. Petersburg to—	*Rubles.*	*Rubles.*
Vladimir	6.64	4.98	Helsingfors	15.00	9.30
Kovrov	8.89	6.66	Narva	5.63	4.23
Nizhni-Novgorod	15.38	11.53	Taps	10.28	7.71
St. Petersburg to—			Reval	12.98	9.74
Gatchino	1.58	1.19	Baltic Port	14.67	11.00
Pskov	9.64	7.23	Juriev	14.26	10.70
Dvinsk	18.64	13.98	Riga	20.40	15.31
Vilno	24.68	18.51	Abo	18.10	11.30
Koshedary	27.04	20.28	Vladikavkaz	88.83	64.28
Kovno	28.31	21.24	Kiev	55.61	41.73
Virballen	31.35	23.51	Odessa	72.94	54.71
Libau	32.44	24.34	Orenburg	76.58	55.88
Grodno	30.19	22.64	Rostov on Don	71.31	51.88
Belostok	33.11	24.84	Sebastopol	77.78	56.78
Warsaw	39.21	29.41	Kharkov	51.24	36.83
Wiborg	5.30	3.30	Tsaritsine	61.51	44.56
Rekhimiaki	12.90	8.10			

NEW ZONE SYSTEM OF PASSENGER CHARGES.

A new schedule of passenger rates is in preparation, to go into effect on the 1st of January next. The principles agreed upon by a railroad conference recently held are as follows: The passenger fare of the third class forms the basis. For the first 160 versts (106.08 miles) the fare is 1.4375 kopecks per verst, or, roundly speaking, 1 cent per mile; that is, 2.30 rubles, or $1.15, for the whole distance. For the next 140 versts (92.82 miles) the fare is 0.9 kopeck per verst, or 1.26 rubles (63 cents), for the whole distance, being about two-thirds of a cent per mile. The fare for the distance of 300 versts, or 198.90 miles, is therefore 3.5 rubles ($1.75). The fare is not calculated per verst after the first 300 versts, the distances being divided into zones of 25 versts each, and the additional fare is 20 kopecks per zone or fraction of a zone.

The passenger fare of the third, second, and first classes stands in the proportion of 1, 1.5, and 2.5. For each zone of 25 versts the second-class fare is 30 kopecks, and the first class 50 kopecks.

The State tax levied on passenger fare is 15 per cent for all three classes. This is also levied on passenger baggage at the rate of one-twentieth kopeck per verst for every 10 pounds to a distance of 3,000 versts. For the first zone of 25 versts the same charge is made as for the first 300 versts, namely, 17.25 kopecks, including 15 per cent State tax. For every further zone $1\frac{1}{2}$ kopecks per 10 pounds is added.

FREIGHT CHARGES.

Freight is divided into fast and slow, as elsewhere. Charges for fast freight are uniform, namely one-sixth kopeck (one-twelfth of a cent) per pood per verst (36.112 pounds for 0.663 mile). A Government tax of 25 per cent is also charged.

Slow freight is divided into twelve classes, on which the freight per pood and verst is as follows:

Class.	Kopeck.	Class.	Kopeck.
I	1/10	VII	1/36
II	1/12	VIII	1/40
III	1/15	IX	1/45
IV	1/18	X	1/65
V	1/24	XI	1/75
VI	1/30	XII	1/100

For longer distances there is a reduction of charges on freight included in Classes I to IX, as follows:

Over 200 versts, 10 per cent; over 500 versts, 15 per cent; over 1,000 versts, 20 per cent; over 1,500 versts, 25 per cent; over 2,000 versts, 30 per cent.

CLASSIFICATION OF FREIGHT.

CLASS I.—Dried fruit, groceries, clothes, trimmings, perfumes, cosmetics; explosives, fireworks, grape wine, liquors (whisky excepted); wax and honey, fancy goods, notions, trinkets, smokers' articles, umbrellas, parasols, fishing utensils, household goods, traveling requisites, musical instruments, clocks, watches, mechanical and scientific apparatus; office supplies, unframed pictures, gums, glue, books, school apparatus, skins, leather, leather goods; ivory, amber, horns, tortoise shell; lamps, lanterns; cloth, textile fabrics, mattresses, all kinds of bedding (except gutta-percha), furniture (iron and cane furniture excepted); metal and metal goods (with a few exceptions), models, some druggist goods; copper, brass, bronze, brass and bronze goods; furs (with a few exceptions), footgear (except rubber goods), lead, lead manufactures, arms, feathers, down, porter, ale; clothing, underwear, wool and silk thread, rubber goods; smoked and conserved fish, caviar, crawfish, glass and glassware (with a few exceptions); foreign leaf tobacco, cigars, cigarettes, oranges, pineapples, lemons, olives, pomegranates; hops (not pressed); church articles, precious stones, precious metals, jewelry, silk and hair, brushes, bristles; equipages, vehicles and their belongings; tarpaulin covered with gutta-percha.

CLASS II.—Cucumbers and a few other vegetables, paper and cardboard in boxes, cardboard articles, hammocks, nets, articles made of rope (not specially mentioned in Class IV), common whisky in bottles, matting, weights (not copper), cork bark, wooden cornices, wooden yokes, wheels without tires (painted and polished), wooden boxes, rifle stocks, fellies, finished thills, cork soles, picture and mirror frames, frames for lounges and other furniture, door and window frames, wooden trunks with iron trimmings, bath tubs, velocipedes, ventilators, spindles, shafts, tin plate, tubes, metal signs, augers, gimlets, iron articles, enameled iron, galvanized iron, iron covered with copper and rubber, locks and keys, all articles of tin plate (not specially men-

tioned), wire and bells, blank swords, steel bells, skates, grave crosses, iron and steel furniture, saws, cutlery (not specially mentioned), axes, iron monuments, trays, carriage settings, kitchen iron, tin plate, cast iron, door and window trimmings, articles of wire, steel carriage springs, drills, steel articles (galvanized, tin-plated, and enameled), gun barrels, iron stirrups, metal springs, presses, tin-plated articles, iron safes, capstans, iron brushes and tongs, iron boxes, vaseline, wax, kerosene, margarine, paraffin, naphtha oil, spermaceti, serpentine stone, malachite, lapis-lazuli, jasper, stone articles (not packed), oilcloth, tents, sails, coarse cloth, dynamo-electric machines, sewing machines, knitting machines, babbitt metal, type, type metal, metal refuse, raw alcohol, albumen, ammonia, polishing paper, shoe blacking, tartar, glucose, acids, copperas, Iceland moss, arsenic, emery, glass powder, spirits turpentine, wood, alcohol, polishing powder, unwrought bronze, raw furs, fishing articles, wooden cages, cane articles, carpets and rugs of cocoa fiber, baskets (except those made of wire), cane rugs for sugar refineries, furniture made of cane, twisted articles of wire, straw, grass, withes, etc.; yarn, thread, flowers, sieves, wax candles, varnish, spirits (not in casks), Russian tobacco, grass fiber, dry plants, seaweed, wadding, all sorts of wool, camel's hair, goat hair, cow hair, tails of cattle.

CLASS III.—Tarpaulin, liquors in casks, earthenware, terra-cotta ornaments, terra-cotta stoves, crucibles, smoking pipes, batteries for warming and ventilation, iron axletrees, tin pails, iron gates, digging tools, iron chimneys, iron doors, signal disks, heating tubes, fireplaces, boilers, valves and lids of metal, pinchers, ladles, paddle boxes, metal receptacles for rubbish, iron bedsteads, portable forges, iron castings, iron hoops, casings, eaves, stairways, shoes for sledges, iron plugs, steel springs, iron frames, retorts, clasps, coast telegraphs, wire brushes, iron and steel spokes, steel tubes, iron cylinders, iron bottom plates, seal and whale blubber, crude earths, wax, fish fats, stearin, schist, glimmer, chemicals, colors, sumac, lead extract, elder flowers, lime flowers, latten and copper plate, unwrought latten and sheet tin, refuse of metals, crude copper and brass, slake of copper, crude pinchbeck, wall paper, leaden and zinc ash, scoria, beer, Russian porter, crude and manufactured lead and zinc, candles (except wax candles), alcohol (in barrels), matches, glass jars, glassware for table and kitchen use, lamp glass, green bottle glass, clover and lucerne seed, grass seeds, oil seeds (not specially mentioned), vegetable seeds, common Russian tobacco (from American seed, in leaves, bunches, and packages), snuff, china ware (except telegraph insulators), fresh fruits (except those mentioned in Class I), jute, eggs.

CLASS IV.—Vermicelli, macaroni, coopers' ware, paper and cardboard (except as mentioned in Class I), mineral and fruit waters and other cooling drinks (except cider and fruit kvas), nearly all kinds of wood and manufactures of wood (except those mentioned in Class V), oleine, paraffin, precious stones, minerals (not mentioned in other

classes), lumber and all building material of wood, coarse crash, sail-cloth, striped linen, handmade coarse linen, hempen cloth, mustard oil, castor oil, cocoa oil, hemp oil, flax oil, poppy-seed oil, and other oils (not mentioned in Classes I or III), bitter salt, borax, glycerin, tanning wood, bleaching lime, copra, naphthaline, chamomile, sandal-wood, saltpeter, refined turpentine, sea salt, purified sulphur, Brazil wood, soap (except toilet soap), bags and sacks, meat and game (in every shape), leather cuttings, straw (not pressed), wormwood, fodder, unpressed grass and hay, rags, green apples, cotton, cotton waste, bread, parquets, washboards.

CLASS V.—Alabaster, gypsum, asbestus, chalk, cement, asphalt, asphalt articles, earthen pots, earthenware (with white polish), graphite, wooden oars, wooden gates, wooden nails (for vessels), skids, wooden poles, wooden ladles, wood coach boxes, wood wheels without tires, lasts, troughs, tubs, wood grave crosses, wood household articles (not mentioned in other classes), wood spokes, wood steps, wood tubes, bee-hives, shields, firewood, animal refuse, bones, bark, brooms, moss, leaves, ammonia water, tar water, glauber salt, other drugs and chemicals, earth colors, Campeche wood, sandalwood (in bulk), Chile saltpeter, soda, refuse of soda, Brazil wood (in bulk), bast and bast articles, flour, starch, paper cuttings, horn cuttings, live flowers, live plants (not mentioned in Class II), sugar, treacle, molasses, table salt (in packages), tree seeds, pressed fodder (grass), pressed wormwood, pressed straw and hay, vinegar, telegraph insulators, charcoal.

CLASS VI.—Oil cakes; filter stone, millstone; crude sulphur, greens, vegetables, and mushrooms (except those mentioned in Class VIII) ashes, dross, small beer, kras, crude salt, tarred roofing paper, asphalt.

CLASS VII.—Brick, tile, drainage tiles, earths (except coloring stuff), common stone and minerals, ocher, turf powder.

CLASS VIII.—Pickled watermelons, melons, sour cabbage, salted and pickled cucumbers (in casks), pickled pumpkins, residues of malt and grapes, liquid yeast, fragments of glass and porcelain, chaff, bran, sugar beets, cabbage (except Brussels and cauliflower), green cucumbers.

CLASS IX.—Fireproof and fire extinguishing compositions, ores of all kinds, kindlings.

CLASS X.—Raw ground plaster in bags or bulk, fertilizers, coal and turf.

CLASS XI.—When forwarded by car loads exceeding a certain distance, which is variable in the different cases. Brick, tiles, drain tiles, lumber, building material (wood), articles made of wood, cord-wood, common bone, wormwood, charcoal. Some other goods are rated according to this class from certain stations.

CLASS XII.—This class embraces goods carried by the car load a certain distance, which is variable, viz: Oil cake, malt cake, broken glass and pottery, chaff and bran, common brick, roofing tile, all kinds of earth and sand, common stone and minerals, cane and reeds, grass

used in manufacture, cane furniture and articles of any sort made of cane, reeds, straw, withes, or grass.

DIFFERENTIAL RATES.

Besides the normal freight rates, as shown in the above classifications, there are many special or differential rates relating to certain classes or subdivisions of freight when carried by the car load, differing according to distance, which latter differences are extremely numerous and seem to be quite arbitrary. For instance, plaster belongs to Class V carried to any distance not exceeding 170 versts; above 170 to 340 versts one one-hundredth kopeck per pood per verst is added to the freight for 170 versts, which is 7.08 kopecks per pood; for distances between 341 to 681 versts, an addition of one one-hundredth kopeck per pood per verst is made to the freight for 340 versts, which is 8.78 kopecks per pood; for distances exceeding 681 versts this article belongs to Class X.

Some articles are entirely omitted from the normal classification, being subject to differential rates. The principal articles of that kind are the following:

(1) Ropes and cables, except wire ropes, when carried for a distance not exceeding 450 versts, pay such charges as are provided for Class IV of freight; when carried for a distance of 451 to 800 versts, one-sixtieth kopeck per pood per verst is added to the freight for 450 versts, which is 22.50 kopecks per pood; when the carriage exceeds 800 versts they are rated as freight of Class V.

(2) Agricultural tools, implements, and machines, when shipped to a distance not exceeding 180 versts, belong to Class V; above 180 to 550 versts, one-fiftieth kopeck per pood per verst is added to the charge for 180 versts, which is 7.50 kopecks per pood; for a distance of 551 to 1,745 versts one one-hundredth kopeck per pood per verst is added to the charge for 550 versts, which is 14.90 kopecks per pood; for distances exceeding 1,745 versts they belong to Class X of freight.

(3) Machinery (except agricultural), parts of machines and attachments are mostly subject to the following rates: For a distance not exceeding 540 versts they belong to Class III; from 541 to 677 versts one one-hundredth kopeck per pood per verst is added to the charge for 540 versts, which is 30.60 kopecks per pood; exceeding 677 versts they belong to Class IV.

Live animals of the small kind pay one-half of a kopeck per head per verst; horses, mules, asses, ponies, and camels, 3 kopecks per head per verst. Neat cattle have special rates.

CHARLES JONÁS,
Consul-General.

ST. PETERSBURG, *July 18, 1894.*

SUPPLEMENTARY REPORT.

Railways in Russia are owned mainly by the Imperial Government, but some by private corporations. On January 1, 1895, the total length of all the Russian railroad lines was 34,670 versts (22,986 miles). Of this mileage the Government operated 16,866 versts (11,182 miles), of which 3,472 versts (2,302 miles) were of double track, including the Transcaspian Military Railway (1,343 versts, or 890 miles) and railways in Finland (2,108 versts, or 1,398 miles). The private corporations operated 14,353 versts (9,516 miles), of which 3,826 versts (2,537 miles) were of double track.

On the 1st of April, 1895, the total length of the Government lines was 20,290 versts (13,452 miles), of which 4,759 versts (3,155 miles) are of double track, including the Transcaspian Military Railway (1,343 versts, or 890 miles) and lines in Finland (2,108 versts, or 1,398 miles). The length of the private railways was 11,115 versts (7,369 miles), of which 2,539 versts (1,683 miles) were of double track. The total length of all the railways in the Empire of Russia was, on the 1st of April, 34,856 versts (23,110 miles), showing an increase in the length of 186 versts (123 miles) from January 1 to April 1, 1895. On January 1, 1893, the total length was 20,982 miles, and on January 1, 1894, 22,091 miles, being an increase of 1,109 miles in 1893. On January 1, 1895, the total length was, as stated before, 22,986 miles, an increase of 985 miles in the year 1894.

So far as known, there are 6,000 locomotives and 120,000 cars now in use in Russia.

The Vladikaukaz Railway Company, which operates 812 miles of railroad, has received a sanction from the Government to build a new branch, which will be 336 miles, uniting Tsaritsin, on the Volga, with Tirhoretsk station, and to be completed within three years. This new line will give a third alternative direct route to the Black Sea, and it is expected will greatly relieve the annually congested traffic in grain destined for export from the southern ports. The capital has been raised by the issue of obligations guaranteed by the Government.

JOHN KAREL,
Consul-General.

ST. PETERSBURG, *May 29, 1895.*

ODESSA.

All the railways in Russia are under the control of the Russian Government. The tariffs of railways open to the public, whether owned by the State or by private individuals, are subjected to Government supervision and guidance. By the word tariff, is meant not only the pay-

ment for carriage but also all supplementary and other dues levied by the railway lines and the regulations applying to these rates and dues. On January 1, 1894, about one-half the railways belonged to the Russian Government, and on January 1, 1895, the Government will own nearly two-thirds of all the railways.

LENGTH OF LINES.

The names, terminal points, and length of lines are given below. The lines at present owned by the Government are marked with an asterisk.

Name of line.	Terminal points.	Length.
		Miles.
Baltic	St. Petersburg and Baltic Port	377⅓
Baskuntchak*	Baskuntchak and Vladimir	35⅓
Borowitchi	Borowitchi and Ousloroka	19⅓
Warsaw	Warsaw and Vienna	305⅓
Warsaw*	Warsaw and Terespol	334⅔
Vladikavkas	Novorossisk and Petrousk	604
Griasy	Griasy and Tzaritzyn	574⅔
Ianckoy*	Ianckoy and Feodosia	72⅔
Dvinsk	Dvinsk and Vetebsk	162⅔
Donetzkoy	Marinpol, Twerenov, and Slaviansk	410
Ekatericinsky	Dohnskaya and Ekaterinoslav	332⅔
Kavkasky*	Poti, Baku, and Batoum	664
Transcaspian*	Usun Ada and Samarcand	896
Ivangorod	Ivangorod and Dombrovsky	300
Ivinovsky		22
Kiev	Kiev and Voronesh	294⅔
Koslovo	Koslovo, Voronesh, and Rostoff	578⅔
Kursk*	Kursk, Karkov, and Azov	510
Libau*	Libau and Romny	794
Lodrinskya		17⅓
Lozovo	Lozovo and Sebastopol	421⅓
Mitau	Moscow and Riga	86
Moscow	Moscow and Brest	682
Moscow*	Moscow and Kursk	334⅔
Moscow	Moscow, and Nizhni-Novgorod	282
Moscow	Moscow, Yaroslav, and Vologda	360
Mouremsky*		68
Nicolaevsky	St. Petersburg and Moscow	406
Novgorod		104⅔
Novotorsksky*	Rzkev and Viazma	162⅔
Oboyansk		20
Orel	Orel and Vitebsk	325⅓
Orel*	Orel and Griaze	230⅔
Polosskaia*	Rovno, Baranovitch, Bialostock, and Brest	956⅔
Privissliansky	Reuel and Warsaw	328⅔
Pskov*	Pskov and Riga	246
Riga*	Riga and Doinsk	155⅓
Riga*	Riga and Tuckum	40
Rybinsk	Rybinsk and Bologoy	186⅔
Riazan*	Riazan and Oural	480
Samara	Haloust with Orenberg line	940
St. Petersburg	St. Petersburg and Warsaw	875⅓
Syszan*	Syszan and Viasma	860⅔
Oural*		673⅓
Fastov		220⅔
Finland		1,169⅓
Kharkov*	Kharkov and Nicolaiev	688⅔
Shina	Shina and Ivanova	114
Southwestern	Odessa, Graen, Nolochisk, Kiev, and Elizabethgrad	2,175

The termini and main points touched by the Southwestern Railway are: (1) Odessa; (2) Reni (Roumanian frontier); (3) Ungenny (Roumanian frontier); (4) Wolochisk (Austrian frontier); (5) Radzurlln (Austrian frontier); (6) Graen (Prussian frontier); (7) Kiev; (8) Elizabethgrad.

The total length of line is 2,175 miles, and the distance between main points is as follows:

From—	To—	Distance.	From—	To—	Distance.
		Miles.			*Miles.*
Odessa	Graen	745	Odessa	Kiev	409
Do	Wolochisk	341	Do	Elizabethgrad	296

The double lines are: Bialostock to Brest, Odessa to Reuel, Shmerinka to Wolochisk, Rasdelnia to Bendare, Kasatin to Kiev.

There are twelve arrivals and twelve departures of trains daily from the southwestern depot at Odessa.

PASSENGER RATES.

The first-class rates for passengers on all railways is 3 kopecks[1] per verst (0.663 mile); for second-class passengers, $2\frac{1}{4}$ kopecks, and for third-class passengers, $1\frac{1}{4}$ kopecks, with an allowance of 36 pounds of baggage free for each passenger, extra baggage being charged at the rate one-half kopeck per verst for every 9 pounds or less.

FREIGHT RATES.

The freight rates are 8 kopecks per head per verst for work cattle, such as oxen, cows, bulls, horses, and mules; 1 kopeck for calves and swine; one-quarter kopeck for sheep, goats, and dogs. For slow goods trains three maximum rates are fixed, according to the three classes of goods circulated in trade, viz: First-class goods, one-twelfth kopeck; second-class goods, one-fourteenth kopeck; and third-class goods, one-twenty-fourth kopeck. The goods enumerated in these three classes, however, only include 130 denominations, and this is not by any means a complete list of the articles transported by the Russian railways. The first class includes fifty-two varieties; iron and lead wares, copper, cast iron, metals (both wrought and unwrought), cotton yarn, woolen goods, foreign linen, wines, tea, coffee, sugar, drugs, and colonial merchandise, manufactured goods, mirrors, tobacco, and certain other more costly goods. The second class is made up of forty-four articles, such as ores, charcoal, cotton, building timber, pig iron, bar and sheet iron, lead in pigs, flax, hemp, cloth and linen made in Russia, etc. The third class consists of all kinds of cereals, flour, salt, vegetables, pressed and packed hay, tow, rags, lime, wood, stone, sand, clay, coke, coal, etc., thirty-four varieties in all. Goods not mentioned in any of these classes must be assigned to the one having the most analogy to them. These rates refer to slow goods trains for distances less than 200 versts (132.6 miles). For longer distances the freights are lowered in the following proportions: 10 per cent when the distance exceeds

[1] The consul values the kopeck at one-half cent, which would give the paper ruble a value of 50 cents.

200 versts (132.6 miles); 15 per cent when it is more than 500 versts (331.5 miles); 20 per cent when above 1,000 versts (663 miles); 25 per cent when more than 1,500 versts (994.5 miles); and 30 per cent when it exceeds 2,000 versts (1,326 miles), with the object that rates for short distances shall not be proportionally lower than those for long distances. The reductions are made on the entire distance traversed, and are not calculated separately for each line and section of line.

The rate for goods conveyed at the speed of passenger trains is one sixth of a kopeck per pood (36.112 pounds) per verst.

GOVERNMENT REGULATIONS.

Previous to the Government control of the railways, the competition between the different lines was one of the principal causes of disorder and disagreement in railway rates. In order to avoid this, the tariff (Government) regulations provided general bases, which were put into force in March, 1890. These regulations comprised the following: (1) The institution in various directions of equal or corresponding tariffs; (2) a corresponding distribution of freights in one or another direction; (3) a corresponding distribution between competing lines of the direction and receipts for conveying goods in one or another direction.

In the absence of Government control over the tariffs the railway interests suffered, among other things, from an irregular and unjust distribution of charges for conveying goods by direct communication between separate lines, some railways taking advantage of their geographical position and advancing most unjust demands concerning their share of the receipts for direct transport. This question was taken up by the Government tariff committee as soon as they commenced operations, and it was determined that the share of each line should be proportional to the distance the freight had traveled thereon. The only exception to this was in case the distance traveled should be less than 120 versts (79½ miles). For the transport of wheat, coal, anthracite, coke, and coal briquettes, a premium was granted in the following terms: Should the distance the goods were conveyed be under 70 versts (46.4 miles) the carriage is computed according to the limiting tariff of the line for the distance traveled, but not higher than one twenty-fourth kopeck per pood (36.112 pounds) per verst for wheat freights and one fifty-fifth kopeck for the other goods mentioned. Should the distance exceed 70 versts the carriage for the first 70 is calculated in the manner just described and the extra distance is paid out of the remainder of the general carriage payment, proportionally to the distance traveled, even should the total distance along the line from which they were dispatched be less than 120 versts (79½ miles).

INTERIOR WATERWAYS.

The total extent of natural and artificial waterways in European Russia amounts to about 56,000 versts (37,128 miles), of which rafting rivers form 23,000 versts (15,249 miles), and navigable rivers 33,000

versts (21,879 miles), while steamers cover a distance of only 20,000 versts (13,260 miles). The freight rates on these waterways fluctuate according to the amount of business and the state of the water and fair ways. The distance of the transport is of little consequence. The most important are the freights on breadstuffs, which in 1891 were as follows: On the Volga, below Rybinsk, the freight on cereals transported in steam tugs going upstream was one two-hundred-and-fifty-third kopeck per pood per verst (36.112 pounds per 0.663 mile); going downstream, one two-hundred-and-twenty-fifth; by rafts, one three-hundred-and-fifty-third. Above Rybinsk, by means of horse towing, upstream, one seventy-eighth kopeck, and by windlass and capstan towing, one-eightieth kopeck. On the Kama, by means of steam tugs, with the current, one two-hundred-and-seventeenth kopeck. On the Oka, by raft, one forty-fifth kopeck, and in steam tugs upstream, one-fiftieth kopeck. On the West Dniva, with the current and with oars, one forty-fourth kopeck. On the Dniester to Odessa, by steam tugs, downstream, one forty-first kopeck. On the Dnieper, below the cataracts, to Odessa, on sails and steam tugs, going downstream, one eighty-second kopeck; above the rapids, by rafting, one eighty-eighth kopeck; and by steam tugs, against the current, one forty-ninth kopeck. On the Don, against the current, with the aid of horse towing, one seventy-second kopeck, and with the current, as far as Rostoff, one one-hundredth kopeck per pood per verst.

THE VOLUNTEER FLEET.

The volunteer or patriotic fleet, as it is called, came into existence in 1878, during the last Russo-Turkish war, with the object of performing the duty of cruisers in war time and having commercial objects in time of peace. Large sums of money from all over Russia were subscribed toward establishing this fleet, and every year these contributions continue to flow in. The vessels make regular voyages to China and the Russian possessions in the Far East. The voyage lasts forty days and is made between Odessa and Vladivostok. At present ten steamers, having a total tonnage of 34,000, are engaged in this trade. The names of these steamers are of interest as showing the government, district, or town from whence the funds for their construction were derived. They are *Kostroma*, *Moskva*, *Nizhni-Novgorod*, *Orel*, *Petersburg*, *Rossia*, *Saratov*, *Tambov*, *Yaroslav*, and *Vladivostok*. Two new steamers, now being built in England, will be added to the fleet in the spring, and it is already announced that, commencing in April next, a monthly service between Odessa and the Far East will be inaugurated. The volunteer fleet is every year increasing its activity in the conveyance of passengers and goods from the ports of the Black Sea to Vladivostock and Nikolaevsk. The number of persons carried, hardly reaching 1,300 in 1882, in 1893 rose to 8,000, while the quantity of cargo for the same period rose from 4,800 to more than 800,000 poods. The distance traveled is

10,000 miles. The cabin passenger pays 500 rubles ($250), including food for the voyage from Odessa to Vladivostok; the deck passenger, 100 rubles for the same distance, also with food. Cargo is charged 30 to 40 kopecks a pood (36.112 pounds).

OCEAN AND GREAT COASTWISE LINES.

La Compagnie Russe de Navigation à Vapeur et de Commerce.—This company is the largest of the steam navigation companies in Russia. Its headquarters are at St. Petersburg, but its principal and most important office is at Odessa. It has under its control in the Black Sea and the Sea of Azov 40 passenger steamers (first and second class), having a displacement, when loaded, of 84,967 tons and an indicated horsepower of 43,630; also 6 mixed passenger and cargo boats, having a displacement of 13,800 tons, with 3,720 horsepower; 14 cargo boats, with a displacement of 14,500 tons and 4,300 horsepower; 3 tank (petroleum) steamers, having a displacement of 8,970 tons and 3,700 horsepower; 13 steam tugs, with a displacement of 2,880 tons and 3,660 horsepower; 7 steam launches, with 227 tons displacement and 604 indicated horsepower. There is a direct weekly line of steamers between Odessa and Alexandria (Egypt), calling at Constantinople, Smyrna, Chio, and Piraeus; and a weekly line between Odessa and Alexandria, which calls at Constantinople, Dardanelles, Mount Athos, Salonica, Piraeus, Chio, Smyrna, Tripoli, Beriut, Jaffa, and Port Said. There is also a line of steamers (once a week) between Sebastopol and Constantinople; also a line between Odessa and Batoum, with stops at Constantinople, Iniboli, Sinope, Samsoun, Ordou, and Trebizonde, and at any other Turkish port on the Black Sea when it is necessary. There is also a line of steamers between Odessa and Batoum which stops at all of the Russian ports on the Black Sea and connects at Kertch with a line of steamers which stop at all of the ports on the Sea of Azof. There is a direct line between Odessa and Batoum, with stops only at Sebastopol and Yalta. The service between Batoum and Odessa, and vice versa, is five times weekly in summer and three times in the winter. The service on the Sea of Azof is usually closed by ice early in the month of December.

This company has also a line of boats between Odessa and Nicolaiev, between Odessa and Kherson, and between Nicolaiev and Kherson. From Kherson a line of boats runs up the Dneiper River as far as Alexandrovsk.

Other lines.—There are two or three smaller companies doing a freight and passenger service on the Black Sea, but the lines already mentioned are the principal ones.

There is a weekly service between Odessa and Danube ports by the Gagarine Line. The volunteer fleet, the Russian company, and the Gagarine Line are all subsidized by the Russian Government. The

Austrian Lloyds has a weekly service between Odessa and Danube ports; a French company has a regular line of steamers between Marseilles and Odessa, and an Italian company runs boats twice in each month between Odessa and Italian ports. The importance of Odessa as a shipping port will be best understood by a reference to tonnage and value of the articles exported. The tonnage for the year ending December 31, 1893, was 2,073,750. The value of the exports was $46,861,880. More than one-half of this tonnage was carried on British steamers.

THOS. E. HEENAN,
Consul.

ODESSA, *December 18, 1894.*

THE GREAT SIBERIAN RAILWAY.[1]

Soon after the annexation by the Russian Empire of those vast tracts of land known as the Amour and Littoral territories and the Ussuri country, a serious want was felt for better ways of communication to assist in retaining them, and to induce settlers to occupy and cultivate them. The first to interest himself in the matter of constructing a railway through Siberia was Count Muraviov Amoursky. After his successful expeditions on the River Amour, he reported that the channel of entrance into the river was unsatisfactory, whence came the idea of using the Bay of De Castri, in the Straits of Tartary, and of uniting it with Sophisk, on the Amour, by a carriage road which he recommended should be constructed in such a way that it could afterwards be converted into a railway. In 1857, therefore, surveys were made by Colonel Romanov looking to that end. This road, however, was not destined to be built, as the means requisite were not forthcoming.

Next, an Englishman named Dull suggested the plan of constructing a horse railway from Nizhni-Novgorod, through Kazan and Perm, to one of the Pacific ports, but this scheme did not find supporters. About this time, Mr. Collins, an American citizen, asked the Russian Government to grant him the right to form a stock company to operate under the name of the Amour Railway Company between Irkutsk and Chita. This proposition was duly examined by the ministry of ways of communication and also by the special Siberian committee on roadways, and was rejected.

A third proposal followed in 1858, this time looking to the construction of a railway between Moscow and the Tartar Strait. This scheme was proposed by Messrs. Morrison, Horn, and Sleigh, English capitalists, who, although asking no guarantee from the Government, demanded such considerable privileges that a grant would have ended in throwing the entire industry and trade for many years to come into foreign hands, and was accordingly rejected by the Government.

---

[1] Reprinted from Consular Reports, July, 1894.

In the same year, Sofronov brought forward a plan to build a railway from Saratov across the Kirghiz plains to Semipalatinsk, Minusinsk, Seleginsk, the Amour, and Pekin. This scheme met with innumerable objections, and, like many of the others, was not supported by sufficient evidence of capital. It therefore came to no practical end.

In 1862, a scheme was proposed by Kokorev & Co. looking to the uniting of the Volga and Obi basins, the two great rivers of European Russia and Siberia. This seemed to be more practical. Surveys were accordingly made from Perm through the Nizhni-Tagil works to Tiumen, a distance of 678 versts,[1] with a branch of 13 versts to Irbit. This plan was further studied by Colonel Bogdanovich, who, in 1866, reported to the minister of the interior in substance as follows:

> After removing all difficulties in the way of furnishing provisions to the governments of Perm and Viatka, it is my belief that the only practical means of avoiding a similar famine to that of 1864 in the Ural country is by the construction of a railway from some of the interior governments to Ekaterinburg and thence to Tiumen. Such a road, should it be subsequently continued through Siberia to the Chinese frontier, would, in my opinion, acquire a vast importance for the development and safety of the country.

Accordingly, Bogdanovich was authorized to make surveys for the construction of a railway from Yershov through Ekaterinburg to Tiumen. The governor-general of western Siberia, Adjutant-General Khruschov, took a deep interest in this subject, and in 1869 addressed a memorial to the Emperor, pointing out the necessity of a railway to connect Nizhni-Novgorod, Kazan, and Tiumen.

At this time, therefore, the question of building a Siberian railway had settled into three sharply defined routes. All three were to begin at Perm and end, the first and third at Tiumen, and the second at Bielozersk and the Tobol River. The first of these routes was named the northern, the second the middle, and the third the southern. After further consideration by the Government, it was deemed advisable to build only part of the line projected, namely, a road to join Kama with the Tobol River, a distance of 700 versts.

Surveys were made in 1872, 1873, and 1874 by the Government, and ended in the establishment of three principal routes: (1) Kineshma, Viatka, Perm, and Ekaterinburg, 933 versts; (2) Nizhni-Novgorod, Kazan, Krasnoufimsk, and Ekaterinburg, 1,172 versts; and (3) Alatyr, Ufa, and Cheliabinsk, 1,173 versts. The committee of imperial ministers, after examination, decided, in 1875, to favor the Siberian Railway from Nizhni-Novgorod along the Volga to Kazan, Ekaterinburg, and Tiumen.

About the same time a petition was started for the construction of a road from Vladivostok to Lake Khanko, which, however, owing to the difficult position of the imperial finances, was postponed for further consideration. The Government continued to interest itself in the

---

[1] 1 verst = 0.663 mile.

enlargement of the general system of railways which had reached Orenberg in 1877. The following year the Ural Railroad was opened, and in 1880 the magnificent bridge over the Volga, named in honor of the Emperor Alexander II, was completed. At the close of this year an imperial ukase was signed for the construction of a road between Ekaterinburg and Tiumen.

It may be interesting to note that, in 1880, the engineer Ostrovsky suggested a through line across Siberia, which almost exactly corresponds with the Great Siberian Railway as now in process of construction. In 1890, a special commission was formed under the Imperial Minister Vyshnegradsky, looking to the construction of this railway by foreign capital. Several Americans, together with other foreigners, thought seriously of forming a company for the construction of this road, but capitalists abroad hesitated to invest the money requisite for such a mammoth undertaking. A change in the imperial ministry soon after placed Serge Witte, former director of the department of railways, at the head of the ministry of finance. Minister Witte took the stand that work upon the Great Siberian Railway should begin at once, and that the road should be constructed by Russian capital and Russian engineers. Accordingly, on February 21, 1891, by direct order of the treasury, this plan was laid before the Emperor for approval. On March 17, 1891, in the name of the Czarewich, the question of constructing the Great Siberian Railway, as suggested by the present minister of finance, was decided in the affirmative. The imperial rescript was promulgated personally by the Czarewich on May 12, in Vladivostok, and His Imperial Highess laid the first stone of this mighty work, destined to take one of the foremost places among the important enterprises of the expiring century.

The work was divided into three parts. The first consisted of the western Siberian section, from Cheliabinsk to the River Obi (1,238 versts in length), and of the middle Siberian section, from the Obi to Irkutsk (1,754 versts), together with the completion of the Vladivostok-Grafskaya section, now nearly finished, and the building of a line to connect the Siberian Railway with the Ural mines. The second included the sections from Grafskaya to Khabarovka (347 versts), and from the station Mysovskaya, the commencement of the line on the other side of Baikal, to Sretensk (1,009 versts). The third included the building of the Circumbaikal road (292 versts), and the line from Sretensk to Khabarovka (2,000 versts). The first is under contract to be completed not later than 1900. This order of construction and division of the work was approved by imperial ukase on December 10, 1892.

GEOGRAPHICAL AND TECHNICAL FEATURES.

From Cheliabinsk to Kurgan the road departs from the straight line only when necessary to avoid local obstructions, such as lakes, marshes, and deep valleys. Farther on, it passes through Petropavlovsk to

Omsk, still adhering, as far as practicable, to a straight line, and when 5 versts from Omsk, it crosses the Irtysh on a bridge 2,100 feet long. Thence, the road leads across Barabinsk steppe through the governments of Tobolsk and Tomsk, through the town of Kainsk, and when nearing the village of Krivoschekov, it crosses the Obi on a bridge 2,800 feet long at verst 1,325.

The section from Cheliabinsk to the Obi runs, in general, through a very productive soil of chernoziom, while the climate is favorable to the growth of cereals. Through the entire length of the road, as far as Obi, there are no serious difficulties in the way of construction. The spanning of four large rivers, however—namely, the Tobol, Ishim, Irtysh, and Obi—requires the construction of earthworks and bridges. Because of the evenness of the surface, gradients are not greater than 0.0074 and the radii of the curves are 1,750 feet.

After crossing the Obi, the road leads through a hilly country and crosses five large rivers—the Obi, Tom, Yaya, Kiya, and Chulym. Nevertheless, the gradients are limited to 0.008 and the radii of the curves to 1,750 feet. From Achinsk to Irkutsk, a distance of 1,191 versts, the country becomes mountainous, and the road crosses two large rivers, the Chulym and Yenisei, and several of their tributaries. It is worthy of note that most of the Siberian rivers run from south to north, and therefore the line must intersect them at their summit levels. These levels of the branches of the Altai, Gremiachevsk, Yeniseisk, and Sayansk chains are high and narrow, and, consequently, the line from Achinsk to Nizhneoudinsk and from Uktouisk was planned with gradients of 0.015 and with curves of 1.050 to 1,000 feet. Through this country, therefore, the topographical conditions make the construction of the roadbed very expensive, the embankments sometimes reaching 70 feet in height.

The road crosses the Yenisei at verst 2,049, on a bridge 3,150 feet long. The highest point of this section is at verst 1,976, between the Little Ibruil and the Little Kemchug, where it is 784 feet above the River Chulym and 959 feet above the Yenisei. After crossing the Yenisei, the road winds along the heights near Krasnoyarsk, and begins to climb the summit level, first along the Berezovka River and thence along the valley of the Sitik, reaching its highest point at verst 2,116. It is necessary to cross the several tributaries of the Berezovka and the Sitik by numerous bridges. The length of this ascent is 67 versts, and eighty-two bridges and pipes are necessitated. After passing the town of Kansku, the line crosses the River Kan on a bridge 1,400 feet long. From Nizhneoudinsk to Uktouisk, the road runs through a more level country, crossing the rivers Uda, on a bridge 1,050 feet long, the Iya, on a bridge 700 feet long, and the Oka, on a bridge 875 feet long, the latter at verst 2,830, and passing several summit levels between these rivers. From the River Oka, the line passes across the country to Polovina station, at verst 2,968, where the technical features are those of mountainous sections. From Polovina station to Irkutsk, the

line is more level, having to cross only the rivers Belaya and Maltinka. The Irkutsk station is fixed at verst 3,065, 4 versts from the ferry across the Angara on the overland road from Moscow to Irkutsk and opposite the town itself.

From Irkutsk, the road wends its way to Lake Baikal, whose shore it follows for 162 versts, as far as the station of Mysovsk. Farther on, at verst 3,112, the valley of the Irkut takes the form of a mountain path through which the road will be hung in cuttings of the overhanging granite crags. At verst 3,146, because of the steepness and windings of the River Irkut, where the line crosses the Zyrkyzunsk chain, it was found necessary to construct a tunnel 8,330 feet long, which will be bored with one continuous incline. The mountainous character of the country from the Kultushnaya to the Bystraya, 3,212 versts from Cheliabinsk, is continuous. From verst 3,212, the road winds along the shore of Lake Baikal, and in doing so crosses and pierces the branches of the mountain chains leading to the lake.

In consequence of these topographical features, the Irkutsk-Mysovsk section has been estimated to cost about 4,772,000 rubles.[1] The country through which this section passes is entirely barren, except the town of Irkutsk and some settlements on the shores of Lake Baikal. From Mysovsk Harbor the line follows the shore of the lake, and then the line of the River Selenga, which it crosses on a bridge 3,185 feet long. From this point it passes into the Valley of Uda, and thence along the River Pogromnaya. It then enters the Vitimsk plateau, winding along the River Domna, one of the tributaries of the Lena system. Passing the summit level between these rivers, the line climbs the eastern slope of one of the branches of the Yablonovoi chain, which serves as the summit level of the basins of the Lena and the Amour; that is to say, of the Northern and Pacific oceans. From this point the road descends, and winds round the hilly side of the town of Chita, on the bank of the River Shilka, to Sretensk. Because of the topographical difficulties, the Mysovsk-Sretensk section will cost 8,859,000 rubles.

The continuation of the Siberian Railway from Sretensk will be along the valleys of the Shilka and Amour, probably crossing the latter on a bridge 8,400 feet long at verst 6,350. The building of this branch will be subject to topographical conditions similar to those of the Mysovsk-Sretensk system. After crossing the Amour, the line follows the valley of the Ussuri, on the border of the Russian and Chinese empires, a distance of 400 versts. There are several large bridges planned to cross the Khor, Bikin, and Iman rivers. The road comes out of the valley of Suyfun River and passes along the shores of the Ouglov and Amour gulfs, terminating at Vladivostok, the station being on the Bay of the Golden Horn.

The total length of the Siberian Railway from Cheliabinsk to Vladivostok is 7,083 versts (4,696 miles) on the main line alone.

---

[1] 1 ruble = 50 cents.

For purposes of superintendence, the work is divided into seven sections, viz: The western Siberian, from Cheliabinsk to Obi (1,328 versts); the central Siberian, from Obi to Irkutsk (1,754 versts); the Baikal circuit, from Irkutsk to the pier of Mysovsk, on Lake Baikal (292 versts); the Transbaikal, from Mysovsk pier to Sretensk (1,009 versts); the Amour section, from Sretensk to Khabarovka (2,000 versts); the North Ussuri, from Khabarovka to Grafsk (347 versts); the South Ussuri, from Grafsk to Vladivostok (382 versts); total, 7,112 versts (4,715 miles), including the branches to the principal rivers intersecting the main line.

A table giving the estimated cost of the construction of the Siberian Railway, not including, however, all the expenses which this enterprise will entail, is given herewith. It is the intention to institute a number of auxiliary measures in connection with the road, looking to the improvement of the economical conditions and the greater prosperity of Siberia. For example, to construct a branch line between the Siberian and the Ural railways in the interest of the Ural Metallurgical Works, and to build river wharves and construct branch lines to them; to improve the Siberian rivers; to develop steam navigation on the river systems intersecting the road; to establish a route through the Northern Ocean to the mouths of the Obi and Yenisei; to assist colonization along the line; to encourage iron works to be established in Siberia along the railway; to equip and send out geological expeditions for studying the country, and to make exhaustive researches in the Amour tract. To carry out these auxiliary enterprises during the time allotted for the completion of the first section, 14,000,000 rubles have been set apart. Requisite sums will also be appropriated for similar improvements in the districts of the other sections. These expenses will be very great, and it is now impossible to give a reasonable estimate of the outlay. All this is exclusive of the estimated cost of the Great Siberian Railway, as shown in the following table:

Estimate of the cost of the Great Siberian Railway.

[As published by the ministry of finance.]

Class of work.	Cheliabinsk to Obi (1,328 versts.)		Obi to Irkutsk (1,754 versts).		Irkutsk to Mysovsk (292 versts).		Mysovsk to Sretensk (1,009 versts).	
	Total cost.	Per verst.	Total cost.	Per verst.	Total cost.	Per verst.	Total cost.	Per verst.
	Rubles.	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*
Expropriation of land	387, 857	292	299, 727	171	48, 970	168	501, 695	497
Making the track	5, 845, 144	4, 401	12, 909, 873	7, 360	7, 198, 844	24, 654	13, 237, 808	13, 120
Construction works	8, 932, 135	6, 726	16, 544, 912	9, 738	7, 116, 950	24, 374	9, 869, 932	9, 782
Laying the line	3, 923, 854	2, 955	4, 464, 685	2, 545	742, 049	2, 541	2, 931, 002	2, 905
Appurtenances of the line.	176, 140	133	257, 701	147	36, 675	126	168, 523	167
Telegraph	367, 773	277	358, 074	204	70, 201	241	242, 106	240
Buildings along the line	709, 360	534	849, 227	484	196, 860	674	587, 460	582
Station buildings	2, 012, 500	1, 515	2, 767, 225	1, 578	557, 300	1, 906	1, 867, 450	1, 851
Water supply	617, 840	465	1, 304, 195	743	178, 730	612	638, 200	632
Station appurtenances	659, 050	496	748, 955	427	197, 150	675	734, 110	728
Administrative and unforeseen expenses	4, 500, 570	3, 389	5, 525, 115	3, 150	1, 510, 575	5, 174	5, 410, 800	5, 362
Rails and fastenings	8, 583, 922	6, 464	11, 550, 900	6, 585	1, 867, 108	6, 394	6, 442, 416	6, 385
Rolling stock and workmen.	8, 086, 700	6, 089	10, 691, 950	6, 096	1, 671, 730	5, 725	5, 614, 345	5, 564
Carriage of rails, fastenings, etc	2, 558, 634	1, 926	5, 000, 359	2, 851	917, 678	3, 143	5, 063, 916	5, 019
Total	47, 361, 479	35, 662	73, 272, 898	42, 079	22, 310, 820	76, 407	53, 309, 763	52, 834

Estimate of the cost of the Great Siberian Railway—Continued

[As published by the ministry of finance.]

Class of work.	Sretensk to Khabarovka (2,000 versts).		Khabarovka to Grafsk (347 versts).		Grafsk to Vladivostok (382 versts).		Total cost (7,112 versts).	
	Total cost.	Per verst.	Total cost.	Per verst.	Total cost.	Per verst.	Total cost.	Per verst.
	Rubles.	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*
Expropriation of land...	1,000,000	500	76,000	219	247,604	649	2,561,889	360
Making the track.....	28,000,000	14,000	4,582,353	13,206	1,712,806	9,724	75,486,828	10,614
Construction works	30,000,000	15,000	3,320,712	9,570	2,657,280	6,960	78,441,921	11,030
Laying the line.....	6,000,000	3,000	1,344,325	3,874	1,189,760	3,116	20,395,675	2,896
Appurtenances of the line.....	320,000	160	86,722	250	62,270	163	2,108,031	156
Telegraph.....	480,000	240	104,252	300	118,420	310	1,740,880	245
Buildings along the line.	1,000,000	500	314,400	906	218,375	572	3,875,682	545
Station buildings.....	3,600,000	1,800	881,250	2,542	1,170,150	3,065	12,856,575	1,808
Water supply	1,200,000	600	249,660	720	316,750	830	4,505,375	633
Station appurtenances...	1,400,000	700	248,500	700	398,100	1,043	4,857,521	617
Administrative and unforeseen expenses.....	11,000,000	5,500	2,002,125	5,700	2,908,336	7,613	32,907,925	4,620
Rails and fastenings.....	12,765,528	6,383	2,254,200	6,496	2,443,851	6,401	45,565,250	6,455
Rolling stock and workmen	11,223,655	5,612	1,917,670	5,526	1,359,200	3,563	40,321,065	5,703
Carriage of rails, fastenings, etc.....	9,566,652	4,783	1,355,713	3,907	858,113	2,248	25,385,865	3,560
Total	117,555,835	58,778	18,738,682	54,002	17,661,051	46,275	350,210,482	49,242

PROGRESS OF CONSTRUCTION.

The Cheliabinsk-Omsk line is fast nearing completion. The middle Siberian section, the construction of which was begun in 1893, is now well under way. The ministry of ways of communication hopes to finish the Ussuri line before the term fixed, that is, before the autumn of 1894. The condition of the work on October 1, 1893, was, in general, as follows:

On the first section of the line, from Cheliabinsk to Omsk, which was begun in 1892, 80 per cent of the roadbed is completed. During the period from May 20 to October 1, 28 bridges were constructed on the same section, rails laid down for 240 versts, and telegraph communication opened up to the town of Omsk.

On the second section of the Western Siberian line 751,100 cubic feet more of earthwork were handled, 3 station buildings constructed, and all the necessary materials prepared.

On the first section of the Middle Siberian Railway, from Obi to Krasnoyarsk, final surveys have been made on 300 versts, and the remainder are now under the engineers, 833,000 cubic feet of earthwork were handled during the summer months, 20,000 railway ties were prepared, and 210,000 poods[1] of rails received.

On the Ussuri line telegraphic communication has been arranged for a distance of 377 versts—two wires for 141 versts and one wire for 236 versts. The construction of station buildings is now practically completed, and the roadbed is nearly finished. Furthermore, 22 locomotives and 368 cars and platforms have been brought to this line. Since

[1] 1 pood = 36 pounds.

November 2, 1893, the transportation of passenger and merchandise cars has been begun between the stations of Vladivostok and Nicholsk, distance of 101 versts.

Owing to the development of the existing Russian railways and to the construction of new lines, the demands for rails have greatly increased at all the rail-rolling mills of European Russia. Therefore the construction of new mills is very desirable, especially in Siberia. None of the mills now existing in that country are able to turn out the necessary quantity of rails for a certain period. Therefore, the proposition of the Bogoslovsk metallurgical district to build a rail-rolling mill has been accepted, with the sanction of the Czar, by the committee of the Siberian Railway. From an economic point of view, the construction of the above-mentioned mill will in nowise be prejudicial to the development of the rail-rolling industry in Siberia, as the 5,000,000 poods of rail which the Bogoslovsk mill has contracted to manufacture will be insufficient to supply the demands of the Siberian Railway. The prices of rails fixed by the Bogoslovsk mill are moderate. During 1892, rails were ordered at the following prices per pood, without delivery: At the Poutilov works, 1.70 rubles; at the Demidov works, 1.58 rubles; at the South Dnieprovsk works, 1.66 rubles; and at the Novo-Rossisk works, 1.76 rubles. By comparing these figures with the prices fixed by the management of the Bogoslovsk district (1.58 rubles at the factory, and 1.76 rubles with delivery at Krivoschekovo) it will be seen that these prices are lower than at the other factories. Furthermere, the ministry of ways of communication had the management of the Bogoslovsk district make a deduction of 1 kopeck per pood on the prices fixed for the delivery of the rails to Krivoschekovo, which, on the whole, makes a rebate of 50,000 rubles. Independently of this, the management of the Bogoslovsk works has contracted to supply a certain quantity of rais besides those ordered to replace such as may become worn out during the first ten years.

One of the principal questions raised in 1893 by the committee of the Great Siberian Railway was the proposition to construct a temporary railway between Irkutsk and Listvinichnaya, a station on the western border of Lake Baikal, and to organize regular steam transportation on that lake, in order to join, by means of uninterrupted steam communication, the Middle Siberian with the Transbaikal Railway. The realization of this scheme is especially desirable, as the construction of the Circumbaikal line, belonging to the third portion of the work, will not be finished in the near future, and as the construction of the temporary line between Irkutsk and the Listvinichnaya, a distance of 80 versts, on an even surface, and the establishment of steam service on Lake Baikal will not involve great expense. On the other hand, the completion of this enterprise, especially after the construction of the railway line to Irkutsk, will be of great importance during the building of the Transbaikal line, as it will facilitate the transportation of the necessary

materials. Furthermore, it will form a convenient means of communication between the Middle Siberian and the Transbaikal lines. In winter, when the steamship communication will have to be suspended, passengers can be transported from one side of the lake to the other on sledges. Lake Baikal is from 35 to 40 versts across at that point, so that it would be very easy to lay down a narrow railroad on the ice. Owing to the above-mentioned reasons, the Czar has sanctioned the building of this temporary line, and it is now in process of construction.

The Middle Siberian Railway will be completed, according to the opinion of the minister of ways of communication, in 1898—two years earlier than was first anticipated. At the beginning it was thought that rails, all necessary materials, and workmen could be brought from European Russia to one point only—that is, to the port of Krivoschekovo, on the Obi, and from there the laying down of the rails was to begin. Closer investigation has shown that the rails and materials can be transported also by the rivers Chulym and Angara, and therefore rails can be laid down at the same time at Achinsk, Krasnoyarsk, and Irkutsk. Besides, it was first supposed that workmen could be had only from European Russia, but it turns out that the local workmen from all parts of Siberia are seeking work in great numbers. Owing to all these facts, the construction of the whole of the above-named railway will be accomplished in 1898. The Achinsk-Krasnoyarsk section, 175 versts long, will be completed in 1895; and in 1896, instead of 1897, the construction of the line from Krasnoyarsk, and at the same time from Irkutsk, will be begun.

The construction of the Transbaikal Railway will be begun in 1895, before European Russia and Irkutsk are joined by rail. Therefore, supplies for the Transbaikal Railway are now under contract.

The construction of a cement factory in the Transbaikal will probably be decided upon and promptly undertaken, thus saving a heavy expense in transportation. In view of this the minister of ways of communication has ordered an investigation of the soil of the Transbaikal region. For this investigation the committee of the Siberian Railway proposes to give 8,000 rubles out of the sums appropriated for auxiliary enterprises.

On the first section of the Western Siberian Railway, from Cheliabinsk to Kurgan, a distance of 240 versts, trains began to run on December 3, 1893, transporting also cargoes belonging to private persons, but only in the direction from Kurgan to Cheliabinsk, as all the trains from this point to the east are loaded exclusively with railroad supplies necessary for the further construction of the Western Siberain Railway. According to information given by the minister of ways of communication, 1,000 rubles are daily earned from the operation of the section from Cheliabinsk to Kurgan, and 600 rubles from the temporary movement of merchandise and passenger trains, opened on November 2, 1893, on the Ussuri line between the stations Vladivostok and Nicho-

laevsk, a distance of 101 versts. On the station of Nevelskaya, situated at verst 146, and the station of Chernigovka, situated at verst 184 of the Ussuri line, the movement of trains for transporting materials and private cargoes began on January 20, 1894. Thus, on the Ussuri line trains are running now over a distance of 184 versts. Since January 1, 1894, 137,550 poods of private goods have been carried by this line, from the transportation of which 30,994 rubles have been earned.

Herewith is appended a map showing the line of the Great Siberian Railway as in process of construction. This map is taken from Volume V of The Industries of Russia, recently issued in Russian by the Russian Government and translated into English and edited by the undersigned. The reader interested in the local, commercial, and strategical features of this great railway would do well to consult the above-mentioned work.[1]

J. M. CRAWFORD,
Consul-General.

ST. PETERSBURG, *May 4, 1894.*

RECENT PROGRESS ON THE LINE.

So far, 1,400 versts (928 miles) of rails have been laid on the Siberian Railroad, but it is expected that 2,500 versts (1,658 miles) will be laid by next winter. It is calculated that in 1898 the road will be fully completed to Irkutsk. The building of the Siberian Railway through the Irkutsk-Chavarovsk district, a distance of about 3,500 versts (2,321 miles), according to a report, will be very difficult, and new plans for the construction of that extension will be prepared.

A few days ago the ministry of ways of communication allowed from the contingent fund the sum of 2,500,000 rubles to the Tiflis government for the construction of the Kars Railway.

JOHN KAREL,
Consul-General.

ST. PETERSBURG, *May 29, 1895.*

FINLAND.

RAILWAYS.

The railways of Finland are the property of the State and are managed by directors appointed by the Government. Trains from the different terminal stations run as follows:

From Helsingfors to St. Petersburg, via Viborg, twice a day, morning and evening. The distance is 441 kilometers (274 miles), and the

---

[1]Volume V, Industries of Russia, was published by the Russian Government in a separate volume in English entitled Siberia and the Great Siberian Railway, with a preface by Consul-General Crawford, for the World's Columbian Exposition at Chicago.

MAP OF THE RUSSIAN EMPIRE SHOWING THE GREAT SIBERIAN RAILWAY

Scale 1: 16.500.000

St PETERSBURG
PUBLISHED
by the DEPARTMENT of TRADE and MANUFACTURE

Operating railways, 31,983 versts.
Railways under construction.
Railways directions rejected.
Total length of the Great Siberian Railway from Cheliabinsk to Vladivostok — 7,112 versts.
Gold mines.
Gold produced in 1890, in poods.
Silver produced in 1890, in poods
Platinum produced in 1890, in poods.

LONGITUDINAL PROFILE OF THE ROAD-BELT FOR THE GREAT SIBERIAN RAILWAY

Cheliabinsk · Koorgan · Petropavlovsk · Omsk · Kainsk · Kalyvan · Marinsk · Achinsk · Krasnoiarsk · Nijneudinsk · Irkutsk · Verkhneudinsk · Chita · Sretchinsk · Khabarovka · Vladivostok

ABSOLUTE HEIGHTS IN ENGLISH FEET.
Versts.

ARCTIC OCEAN · BEHRING SEA · SEA OF OKHOTSK · SEA OF JAPAN · CASPIAN SEA · BLACK SEA · ARCTIC CIRCLE · CHINESE TARTARY

time about fourteen hours. Fares, first class, 37 Finnish marks, or about $7.14[1] United States currency; second class, 24 marks ($4.80). The distance from Helsingfors to Viborg is 312 kilometers (193.9 miles). Fares, first class, 27.50 marks ($5.50); second class, 17.50 marks ($3.50).

From Viborg to Imatra Waterfall, a distance of 72 kilometers (44.74 miles), trains run every day. This waterfall is the largest in Europe. There are good hotels there. Fares, first class, 7.20 marks ($1.44); second class, 4.70 marks (94 cents).

From Helsingfors to Abo, a distance of 275 kilometers (170.9 miles), trains run once a day. Fares, first class, 24.50 marks ($4.90); second class, 16 marks ($3.20).

From Helsingfors to Hango, a distance of 207 kilometers (128.6 miles), trains run once a day. Fares, first class, 19 marks ($3.80); second class, 12.50 marks ($2.50).

From Helsingfors to Uleaborg, distance 752 kilometers (467.2 miles), stopping at Tavastehus, Tammerfors, Wasa, Jakobstad, and Gamla Karleby, trains run once a day. Fares, first class, 53 marks ($10.60); second class, 34.60 marks ($6.92).

From Helsingfors to Kuopio, distance 465 kilometers (287.9 miles), stopping at St. Michel, trains run once a day. Fares, first class, 37.90 marks ($7.58); second class, 24.60 marks ($4.92).

From Viborg to Sordavala, distance 179 kilometers (111.2 miles), trains run once a day. Fares, first class, 16.70 marks ($3.34); second class, 10.90 marks ($2.18).

These railways are all single track, and in very good repair. The trains all carry mails.

---

[1] The vice-consul estimates the Finnish mark at 20 cents.

Distance in kilometers between the railway stations in Finland.

From—	To—																											
	Bennas.	Borga.	Ekenas.	Gamla Karleby.	Hango.	Helsingfors.	Hyvinge.	Iisvesi.	Imatra.	Jakobstad.	Kervo.	Kotka.	Kouvola.	Kuopio.	Lahtis.	Riihimaki.	Simola.	Sordavala.	St. Michel.	St. Petersburg.	Tammerfors.	Tavastehus.	Toijala.	Uleaborg.	Wasa.	Viborg.	Willmanstrand.	Abo.	Ostermyra.
Antrea	729	356	408	761	441	352	293	390	32	740	323	213	161	435	222	281	80	139	275	169	397	317	357	962	705	40	99	485	628
Bennas	-----	523	575	32	608	519	460	897	761	11	490	620	568	842	507	448	649	868	682	818	332	412	372	233	176	689	668	500	101
Borga	-----	-----	178	555	211	62	63	424	388	534	33	247	195	469	134	75	276	495	309	445	191	111	151	756	497	316	295	279	422
Ekenas	-----	-----	-----	607	33	174	115	476	440	586	145	299	247	521	186	127	328	547	361	497	243	163	203	808	549	368	347	331	474
Gamla Karleby	-----	-----	-----	-----	640	551	492	829	793	43	522	652	600	874	539	480	681	900	714	850	364	444	404	201	208	721	700	532	133
Hango	-----	-----	-----	-----	-----	207	148	509	473	619	178	332	280	554	219	160	361	580	394	530	276	196	236	841	582	401	380	364	507
Helsingfors	-----	-----	-----	-----	-----	-----	59	420	384	530	29	243	191	465	130	71	272	491	305	441	187	107	147	752	493	312	291	275	418
Hyvinge	-----	-----	-----	-----	-----	-----	-----	361	325	471	30	184	132	406	71	12	213	432	246	382	128	48	88	693	434	253	232	216	359
Iisvesi	-----	-----	-----	-----	-----	-----	-----	-----	422	908	391	281	229	57	290	349	310	529	115	479	465	385	425	1030	771	350	329	553	696
Imatra	-----	-----	-----	-----	-----	-----	-----	-----	-----	772	355	245	193	467	254	313	112	171	307	201	429	349	389	994	735	72	93	517	660
Jakobstad	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	501	631	579	853	818	459	660	879	693	829	343	423	383	244	187	700	679	511	112
Kervo	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	214	162	436	101	42	243	462	276	412	158	78	118	723	464	283	262	246	389
Kotka	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	52	326	113	172	133	352	166	302	288	208	248	853	594	173	152	376	519
Kouvola	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	274	61	120	81	300	114	250	236	156	196	801	542	121	100	324	467
Kuopio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	335	394	355	574	160	524	510	430	470	1075	816	395	374	598	741
Lahtis	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	59	142	361	175	311	175	95	135	740	481	182	161	263	406
Riihimaki	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	201	420	234	370	116	36	76	681	422	241	220	204	347
Simola	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	219	195	169	317	237	277	882	623	40	19	405	548
Sordavala	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	414	308	536	456	496	1101	842	179	238	624	767
St. Michel	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	364	350	270	310	915	656	235	214	438	581
St. Petersburg	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486	406	446	1051	792	129	150	574	717
Tammerfors	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	80	40	565	306	357	336	168	231
Tavastehus	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	40	645	386	277	256	168	311
Toijala	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	605	346	317	296	128	271
Uleaborg	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	409	922	901	733	334
Wasa	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	663	642	474	75
Viborg	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	21	445	588
Willmanstrand	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	424	567
Abo	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	399

OCEAN LINES.

Finland steamers run regularly once a week between Hull (England) and Helsingfors, leaving each port every Saturday evening, and touching at Copenhagen. The voyage occupies about four days. These steamers carry cargo and passengers. The rates for first-class passengers are 125 marks ($25), and living per day 7 marks ($1.40). Freight for heavy goods, 12s. 6d. ($3.03) per net registered ton, and for measurement goods, 5d. (10 cents) per cubic foot. The steamers are about 650 tons register and of 1,600 indicated horsepower.

First-class passenger and freight steamers are run regularly between Stockholm, Abo, Hango, Helsingfors, Viborg, and St. Petersburg, leaving the terminal ports (Stockholm and St. Petersburg) about three or four times a week. The first-class fares between Helsingfors and Stockholm are 45 marks ($9), and between Helsingfors and St. Petersburg 22 marks ($4.40). Freight rates are moderate. These boats carry mails and are about 400 net registered tonnage, their average speed being 12 knots an hour. This line can be recommended to tourists for cleanliness, attendance, and good table at cheap rates.

Passenger and freight steamers run direct between Lubeck and Helsingfors and Stettin and Helsingfors, touching at Reval. The first-class fares are 60 marks ($12), with 25 per cent discount for return tickets. Freight rates are moderate. The steamers are of about the same size and speed as those running between Helsingfors, Stockholm, and St. Petersburg.

COASTWISE LINES.

Passenger steamers, at moderate rates, run from Helsingfors along the Finnish coast as far north as Uleaborg, touching at every principal port on the way. There is also a very beautiful and interesting tourist route for passenger steamers along the Saima Canal, beginning at Viborg and ending at Kuopio, connecting the numerous lakes in that district. There are, besides, small passenger steamers plying on the lakes in other districts. There is also regular communication once a month between Finland and several of the Mediterranean and French ports.

All these steamers belong to share companies, and are managed by their respective directors.

HERMAN DONNER,
Vice and Acting Consul.

HELSINGFORS, *June 25, 1894.*

NORWAY.

Christiania, the capital and the most populous city of Norway, where this consulate is located, is the center of the commerce as well as of the principal lines of traffic. From here, communication with many foreign countries, and numerous places on the coast line of the country itself, is regularly kept up with comfortable steamships, which are seldom impeded by ice. Christiania is the center of the railway lines, which radiate in different directions and connect this seat of the administration and of the higher education of the country with the inland districts and the sister Kingdom of Sweden.

OCEAN LINES.

(1) *Christiania-America.*—At present no direct line under the Norwegian flag connecting this country with American ports exists. A regular line between the port of Bergen and New York, which was started about fifteen years ago, chiefly for carrying emigrants, was discontinued when the emigration fell off, but the vessels of the Danish Thingvalla Line, which ply fortnightly between Copenhagen and New York, have, during the last decade, regularly called at Christiania and at Christiansand, and have, besides transporting the bulk of the Norwegian emigrants, proved of great advantage to the Norwegian trade with the United States. As these steamers, whose average passage is fifteen days, belong to a company in Copenhagen, I presume that the consul at that port has reported on their number, force, etc. The rates for passengers from this port to New York are 225 kroner ($54.30), and for freight from 16 to 20 shillings ($3.89 to $4.866) per ton.

(2) *Christiania-Hull.*—Wilson Line (British); weekly sailings to Hull, via Christiansand, in about forty-eight hours; distance from this port to Christiansand, fifteen hours; fare to Hull, £4 ($19.47); food not included.

(3) *Christiania-London.*—Wilson Line (British); weekly via Christiansand, in about seventy-two hours; fare, £4 ($19.47).

(4) *Christiania-Newcastle upon Tyne.*—Lloyd's steamers (2), of about 700 tons, belonging to a Norwegian company; weekly sailings, and calling at Laurvig and Arendal in Norway; passage, sixty hours; fare, 45 kroner ($12.06).

(5) *Christiania-Grangemouth.*—A Norwegian line of two steamers of about 1,000 tons; make the run in sixty hours, calling at Tonsberg, Arendal, Christiansand, and Egersund; fare, £2 10s. ($12.17).

(6) *Christiania-Hamburg.*—Sóndenfjeldske Norwegian Steamship Company; weekly sailings; four steamers, calling at Arendal and Christiansand; average passage, fifty hours; fare, without food, 30 kroner ($8.04).

(7) *Christiania-Bremen.*—Sóndenfjeldske Norwegian Steamship Company; weekly sailings, chiefly for freight; fare, without food, 30 kroner ($8.04).

(8) *Christiania-Havre.*—Sóndenfjeldske Norwegian Steamship Company; fortnightly sailings; average passage, seventy-two hours; fare, without food, 80 kroner ($21.44).

(9) *Christiania-Antwerp.*—Ostlandske Lloyds (Norwegian company); two steamers; weekly sailings, calling at Arendal and Christiansand; average passage, fifty hours; fare, without food, 45 kroner ($12.06).

(10) *Christiania-Copenhagen.*—The United Danish Steamship Company run, during the summer months, a semiweekly line of two large steamers, chiefly for passengers; passage, twenty-four hours; calling at Gothenburg; rate of passage, 28 kroner ($7.50). A steamer belonging to this company runs weekly between Christiania and Copenhagen, via Fredrikshavn, Jutland.

(11) *Christiansand-Frederikshavn.*—A triweekly regular line (Norwegian), with one steamer, subventioned by the Norwegian Government for carrying mails to the Danish Jutland; passage, ten hours, corresponding with the railway trains between Hamburg and Fredrikshavn; fare, 15 kroner ($4.02).

(12) *Christiania-Stockholm.*—Sódra Sverige Line (Swedish), with two steamers; weekly sailings, calling at Gothenburg, Helsingborg, Landskrona, Malmo, Ystad, Carlshamn, Ronneby, Carlskrona, and Kalmar; passage, about four days; fare, without food, 40 kroner ($10.72).

(13) *Christiania-Gothenburg.*—Three coast liners (Swedish), plying between the two ports four times a week, in about sixteen hours, during the open season; distance, 150 miles; fare, 16 kroner ($4.28).

(14) *Christiania-Bergen, Drontheim, etc.*—The Bergenski and the Nordentjelvski Steamship companies, with twenty-two and nineteen steamers, respectively, keep up a regular, almost daily, communication during the whole year along the southern and western coast of Norway, carrying mail, passengers, and goods between the smaller ports; distance, Christiania to Bergen, 400 miles; average passage, sixty hours; fare, 36.80 kroner ($9.85), without food.

Other local lines, with excellent and quick steamers, keep up constant communication between the two principal ports of Norway—Christiania and Bergen—calling at Laurvig, Kraziro, Arendal, Christiansand, and Stavanger, besides other smaller ports.

LAKES AND CANALS.

Norway has no navigable rivers, but has a great number of lakes navigated by comfortable steamers. Of the lakes may be mentioned the Miosen Lake, the Randsfjord, and Nordsjo, in the district of Tellemarken, where a system of canals and locks lately finished connect the lakes of the inland districts with the sea. These canals, which have cost about $1,000,000, are controlled by the Government, while the

Steens Canal, which connects the sea near Fredrikshald and the Swedish frontier with the lake of Glieren, is under the control of a company of shareholders.

RAILWAYS.

Norway can boast of only 1,600 kilometers (994 miles) of railways, all single track, and most of them narrow gauge. New lines are, however, being built, and the legislature has lately authorized the construction of some important and long discussed lines across the mountains, to connect the western with the eastern districts of the country, at an expense of about $10,000,000.

The Norwegian railways are controlled by the Government, with the exception of the so-called Norwegian Trunk Railway, between Christiania and the lake of Miosen, a distance of about 50 miles. This railway, the first one in this country, was built about forty years ago, by English engineers, and partly with British capital, and has since been controlled by a combined board of directors representing the Norwegian and the British shareholders. The other principal railway lines within this consular districts are the following:

Christiania to Trondhjem, 562 kilometers (349 miles); principal stations, Hamar and Roros. The fast trains run the distance in about seventeen hours.

Christiania to Frederikshald and the Swedish frontier, about 160 kilometers (99.8 miles); running time about four hours, stopping at Moss, Frederiksstadt, and Frederikshald.

Christiania to Skien, via Drammen and Laurvig, 204 kilometers (127 miles); running time, six and one-half hours.

Christiania to Kongsvinger (Swedish frontier), about 130 kilometers (81 miles); running time, about five hours.

Drammen to Randsfjord, 142 kilometers (88 miles); running time, three and one-half hours.

HIGHWAYS.

The Norwegian highways may justly be considered among the best in Europe, and they attract much admiration from foreign tourists. Their aggregate length is about 10,000 kilometers (6,214 miles). The principal lines are laid through the picturesque valleys of Valvers, Hallingdal, Gudbrandsdal, and Tellemarken, and connect the eastern with the western sections of the country. They are constructed and supervised by the Government, which has had for the past fiscal year an appropriation from the legislature of about $570,000. They are, as a rule, kept in repair by the farmers in the rural districts, on whom this duty is laid as a public burden. For the convenience of travelers, a perfect system of station houses has been established on all the highways, and horses and conveyances are kept ready at a moderate tariff, fixed by the Government.

GERHARD GADE,
Consul.

CHRISTIANIA, *March, 1895.*

SWEDEN.

Sweden, both by land and sea, is provided with excellent means of communication.

HIGHWAYS.

The highways altogether are 37,000 miles in length, have nearly a minimum width of 20 feet, and are generally macadamized.

RAILROADS.

The railroads are the chief means of communication, although they were opened somewhat late—the first in the year 1855. Sweden, per capita, owns more railway than any other country in Europe, while in respect to its area the southernmost portion of the country is about as well supplied with railways as France. The entire length of Swedish railroads is close upon 5,500 miles, rather more than a third part belonging to the State. The entire rolling stock at the end of 1891 was composed of 896 locomotives, 1,928 passenger cars, and 21,651 mail, baggage, and freight cars. During the same year 13,640,000 passengers were carried an average distance of 19 miles each; of freight, 11,230,000 tons were moved an average distance of 34 miles per ton. In other words, about 400,000,000 passengers were carried 1 mile and about 600,000,000 tons of freight were moved the same distance.

The Swedish railroads have been surveyed and built in a thoroughly substantial yet economical manner. The State roads have a standard gauge of 4 feet 8½ inches. The gradients are generally easy, and the smallest curves have a radius of about 1,000 feet. The sleepers are of pine, cut in winter, of best quality, and not impregnated. The rails used by the State roads are manufactured in Sweden of bessemer or open-hearth steel, and weigh 22.8 pounds per foot. The rail joints are all suspended and strengthened by fish plates of angular section, the rail ends being secured by bolts. The rails are attached to the sleepers by spikes. The drainage is provided for by means of open side ditches in the cuts. All lines have single track. All over Sweden rivers are encountered which have to be bridged for the railroads, especially so in the north. Among the longest are the Dal River bridge, which contains five spans, and is built on high latticed iron pillars, and the Ljusne River bridge, which has three spans and is built of continuous lattice girders. The bridge across the Angerman River is the longest and highest of all, measuring about 1,200 feet between abutments; it is built on the cantilever system upon steel trestles in five spans. The tunnels are not numerous and are all short. The longest passes through the hill upon which a portion of the capital is situated. All railroad lines are protected by fences. The passenger cars, as a rule, are built on the intercommunication system and are provided with closets and lavatories.

The State railroads have three classes of passenger cars. The first class are limited to express trains, and are generally but little patronized. The night expresses carry sleeping cars of first and second classes, where a berth may be obtained for the additional sum of $1.35 and 80 cents, respectively, for the night. The trains are sufficiently frequent to meet the demand.

The passenger rates for long or short distances per mile are as follows: First class, about 2.30 cents; second class, about 1.65 cents; third class, about 1.10 cents.

The total income from freight during 1892 was about 240,000,000 kroner, or $64,300,000, for 42,674,327 tons.

The State roads are managed and controlled by the royal board of railways. The accommodations and conveniences are good, and the roadbed and rolling stock are kept in the best condition.

The only railway in the world which enters the Polar Circle is the State line from Lulêa to Gellivara. This line is much used by tourists on their way to Mount Dundred, from which a fine sight of the midnight sun may be had.

WATER COMMUNICATION.

Communication by water plays an important part in this country. Along the entire coast (1,600 miles) a lively traffic is kept up, as also on the great lakes, rivers, and numerous canals. The Gota and Dalsland Canal, in southern Sweden, and the Stromsholm Canal, in central Sweden, are favorite routes for tourists, and have splendid accommodations.

A Swedish passenger steamer, especially if she hail from Stockholm, is a model of cleanliness, neatness, good taste, and almost luxury.

The Swedish merchant service at the close of 1891 numbered 2,979 sailing vessels of 377,667 tons and 1,181 steamers of 152,493 tons.

THOS. B. O'NEIL,
Consul.

STOCKHOLM, *June 5, 1894.*

AFRICA.

MEDITERRANEAN COAST.

MOROCCO.

Morocco contains no through lines of traffic of any kind whatever. There are no highways in the country, communication between the various towns, villages, etc., being carried on by means of mules, camels, and horses.

J. JUDSON BARCLAY,
Consul-General.

TANGIER, *May 15, 1894.*

ROUTE FROM THE UNITED STATES—INTERIOR COMMUNICATION.[1]

The shortest route for shipping goods from the United States to the coast of Morocco is from New York, via Gibraltar, per Anchor Line, German Lloyds, and the Italian line of steamboats; the next best is from the United States via London and Hamburg. Goods meet with the usual care on board the steamships, and are landed at the ports of Morocco by lighters, there being no wharves. Suitable warehouses are provided.

Goods are sent into the interior by camels, mules, and donkeys. A camel's load consists of 5 hundredweight (560 pounds), in two packages; a mule's of 3 hundredweight (336 pounds), in two packages, and a donkey's of 1½ hundredweight (168 pounds), in two packages. Dimensions of packages are immaterial. The usage to which the goods is subjected en route is not so rough as might be expected under existing circumstances. There is no rain in summer to damage goods sent in this season.

OCEAN LINES.[2]

The shipping return shows a large increase in the tonnage visiting the ports of Morocco. The total entrances [1891] were 2,658 vessels,

---

[1] Extract from report of Consul-General Mathews, printed in Consular Reports, January, 1894, p. 212.

[2] Reprinted from Consular Reports No. 140, May, 1892.

with a tonnage of 936,865, and clearances, 2,488 vessels, with 921,374 tons, being an increase of 333 vessels and 159,773 tons over the figures of 1890. This is owing to a number of Spanish vessels which came to Tangier to perform the quarantine to which vessels from various ports of Spain were subjected during the greater part of last summer, and to the continued visits of the German steamers.

France leads the list in point of tonnage. The steamers visiting these ports are of fair size, and consist of Paquet & Co.'s Line, which leaves Marseilles twice a month, visiting Tangier and all the ports of Morocco, and back; the Compagnie Générale Transatlantique, one of whose steamers leaves Oran (Algeria) every Friday, calling at Nemours, Malaga, Gibraltar, and Tangier, leaving this port on Tuesday and returning to Oran after touching for a few hours at the aforesaid ports. Besides these, four other steamers brought Moorish laborers from Oran, and one pilgrims from Jeddah.

British shipping consists of the Forwood steamers (Mersey Steamship Company), which leave London twice a month, calling at all the ports of Morocco, Gibraltar, and return. Pilgrim steamers every year take pilgrims from Tangier to Jeddah and back, and small steamers trade between this port and Gibraltar almost every alternate day.

Spain leads in the number of small vessels. The steamers of the Transatlantic Company sail once a month from Barcelona to Cadiz, Tangier, and the western ports of Morocco; also steamers every Monday, Wednesday, and Friday from Cadiz to Tangier, returning on the alternate days. The Thomas Haynes's Sons' steamers ply irregularly between the European ports of Cadiz, Gibraltar, and Malaga and Tangier and the western ports of Morocco.

German shipping shows a considerable increase. The itinerary of their lines is as follows: The Atlas Line, of Hamburg, to Lisbon, Tangier, and western ports of Morocco as far as Mogador, and back to Hamburg the same way; the Sloman Line, plying between Hamburg and the Mediterranean ports of Barcelona, Genoa, etc., and calling at Tangier on their way out; the Waermann boats, from Hamburg on the 15th of each month for Tangier, western ports of Morocco, the Canaries, Senegal, Sierra Leone, Gold Coast, Kongo, and the German possessions, and returning by approximately the same route to Hamburg.

F. A. MATHEWS,
Consul-General.

TANGIER, *November 28, 1891.*

NAVIGATION RETURNS—NATIONALITY OF SHIPPING.[1]

The general return of shipping at Tangier for the year 1893 shows a total entry of 1,055 vessels, with an aggregate tonnage of 292,355, which is 120 entries and 36,202 tons in excess of the figures for the preceding

[1] Extracts from annual report of the British Consul at Tangier, September 25, 1894.

year. Of this number, 268 vessels were small sailing ships, almost all of them under the Spanish flag, and the remaining 787 were steamers, representing an aggregate tonnage of 285,415. Thus, in the year 1893 there were 21 sailing vessels with 627 tons, and 99 steamers with 35,575 tons, more than 1892.

Of the steamers, the largest number, viz, 372, with 142,615 tons, were Spanish, while 303, with 63,585 tons, were British; 78, with 48,857 tons, were French, and 27, with 23,803 tons, were German.

British shipping shows a decrease of 18 vessels, with 5,307 tons, since the preceding year. The decrease is principally observable in the entries of the smaller steamers engaged in the local traffic between Gibraltar and Tangier, which show 11 entries less than in 1892, being credited altogether with 263 entries, representing 21,247 tons. The Mersey Steamship Company (Forwood Brothers & Co.) trading between London and the Moorish ports, made 18 entries, with 14,975 tons, or 5 entries less than the preceding year. The other entries were 4 steamers of the Hall Line, calling to embark cattle for Lisbon, 12 Hadj steamers to convey pilgrims to Jeddah, 3 tourists' vessels, and 3 other steamers.

Of the 372 steamers that entered under the Spanish flag during the year, 300 vessels, with an aggregate of 117,128 tons, were of the Spanish Compañia Transatlantica, subsidized by the Spanish Government to carry the mails, which run three times a week from Cadiz to Gibraltar and back, touching at Tangier and Algeciras each way, thus making 6 entries a week at this port. The steamers of the firm Sons of Thomas Haynes, of Cadiz, are credited with 57 entries and 16,897 tons. They trade between Cadiz, Gibraltar, and the western ports of Morocco. There were also entries of 11 Spanish steamers calling for oxen for Lisbon, with 3 other steamers these make up the total of Spanish shipping.

The decrease noticed in 1892 in French shipping is still greater in the year 1893, the number of entries having fallen to 78 and the aggregate tonnage to 48,857. The decrease is most marked in the case of the steamers of the Compagnie Transatlantique, which are only credited with 20 entries and 17,489 tons, as against 32 entries in 1892 and 75 in 1891, the cause being that they now only run fortnightly from Algeria to Tangier, and do not go on to Cadiz.

The steamers of the Compagnie Paquet, of Marseilles, trading between that port and the Canary Islands, touching at Tangier and the western Moorish ports en route, made 44 entries in 1893, as against 48 in the preceding year. The remaining entries were chiefly of steamers bringing Moorish laborers back from Algeria, and also 1 Hadj steamer, and a vessel taking cattle to Lisbon.

Fewer German steamers entered this port in 1893 than in the preceding year, their number and tonnage being 27 and 23,803, respectively, whereas in 1892 there were 35 vessels, with an aggregate of 27,329

tons. Of the 27 steamers, 13 were of the Woermann Line, of Hamburg, which call at the Moorish ports en route to the west coast of Africa, 4 of the Sloman Line, which run to Mediterranean ports, and 9 of the Atlas Line, which also start from Hamburg and call at Antwerp, Lisbon, and the Moorish ports.

Of the 7 Dutch steamers that visited this port during the year, 5 were of the Royal Netherlands Steamship Company, on their way to the Dutch Indies, and the other 2 were English steamers temporarily sailing under the Dutch flag, which called to embark pilgrims for the holy places of the Hedjaz.

POSTAL SERVICE.[1]

The year 1892 was, for Fez, the most eventful period since the present Sultan's accession.

In February a British postal agency having biweekly courier service to Tangier was opened, thus for the first time placing Fez in direct and regular communication with abroad and with the Moorish ports.

In the end of July a French firm instituted a biweekly postal courier service to Tangier, Elksar, and Laraiche, in cooperation with the French post-office in Tangier. In the beginning of 1893 this service was taken over by the French Government, and at the same time the Moorish Government established a post of their own, taking letters to other Moorish towns, but not for abroad, so that, whereas in January, 1892, there was no official mail service, now six couriers per week leave for Tangier alone under the control of the Moorish, British, or French Governments.

The Moorish post-office uses no adhesive nor date stamps, but an inked seal bearing the name of the Sultan and the current Mohammedan year.

With regard to the general post and telegraph service,[2] it may be desirable, owing to discrepancies which I have observed in some generally reliable European sources of information, to repeat the intimation that neither telegraphic communication nor parcels-post facilities at present extend beyond Tangier, with the exception, as regards the latter, that parcels may be sent via Hamburg for the German steamers which come here from that port, and are delivered, not through the post-office, but from the steamer agency.

---

[1] Extracts from report of British consul at Tangier, September 9, 1893.

[2] Extract from report of British consul at Mogador, March 28, 1893.

ALGERIA.

OCEAN LINES.

In a dispatch to the Department dated May 8, 1894, and printed in Special Consular Reports, "Extension of Markets for American Flour," page 488, Consul Grellet, of Algiers, says:

Shipping facilities with the United States are not good, owing to the lack of direct communication. Except the steamers of the Hamburg Packet Company and North German Lloyds, which call at Algiers twice a month from November to May, no regular steamship lines ply between the American and Algerian ports. Goods to or from the United States are generally shipped in transit via Marseilles, Havre, Liverpool, London, Antwerp, or Hamburg.

RAILWAYS.[1]

The Algerian railroads are, as a rule, established upon the same financial basis as those of the metropolis, i. e., the interest on the capital invested is guaranteed by the Government, as well as the amount necessary for the working expenses of the respective lines. All advances made by the Government bear interest at the rate of 4½ per cent, to be accounted for by the companies at the date of refunding. There is but one exception to this arrangement, viz, the line from Arzew to Kralfalap, controlled by the Franco-Algérienne Company. No guarantee has been given by the Government, but in lieu thereof a concession of 100,000 hectares of alfa lands have been granted to the company for a period of ninety-nine years.

In the year 1879 the general plans for the construction of the railroads of Algeria were drawn up, and these plans having been rigidly adhered to, the various lines are rapidly approaching completion. The plans referred to are based upon a double consideration: first, the commercial interests of the country; and second, the defense of the territory against enemies, either foreign or domestic.

On the 31st of December, 1888, the total length of completed railroads in Algeria had attained to 2,709 kilometers,[2] and which can be divided into two great sections:

(1) That section which includes the lines running parallel to the seashore, and extending from the frontier of Morocco to the boundary of Tunis, connects, by the aid of the various lines of the second section, all the seaports of Algeria. In the event of any attempt at invasion the system by which the country is intersected and connected by these lines would do much to facilitate the rapid transportation of the Algerian forces from any point in the interior to the coast.

---

[1] Reprinted from United States Consular Reports for April, 1889, No. 104.

[2] 1 kilometer = 0.621376 mile.

(2) This section includes all the lines running from the seacoast to the interior, and may be more properly termed "lines of penetration." In the case of insurrection these lines would be of very great importance and utility in moving troops with dispatch. From a commercial point of view, the whole of these lines are of vital importance, and will assuredly contribute much to the rapid development of the colony. Prior to the building of these lines the means of transportation were of the most primitive description, whereas now the facilities afforded and low rates granted permit of the products of the interior being carried to the seaboard, where ready markets are always to be found.

The following data will furnish some idea as to the position of the Algerian railroads at the end of the year 1888:

From—	To—	Distance.	From—	To—	Distance.
		Kilometers.			*Kilometers.*
First section:			Second section—C'd.		
La Senia	Ain Temouchent	80	Mostaganem	Thiaret	202
Oran	Algiers	426	Bougie	Beni Mansour	88
Maison Carree	Constantine	452	Menorville	Tizi Ouzou	53
Kroubs	Duvivier	148	Philippeville	Constantine	87
Duvivier	Sidi el Henessi	105	El Guerara	Biskra	201
Second section:			Bone	Duvivier	55
St. Barbe du Kelat	Ras el Ma	151	Soukaras	Tebessa	128
Talia	La Moriciere	34	Bone	Am Mokra	33
Arzew	Ain Sefra	454			
Ain Thizi	Mascara	12	Total		*a* 2,709

a 1,683 miles.

All these lines are under the control of six companies, viz: The Paris-Lyon-Mediterranee Company, the East Algerian Company, the Bone-Guelma Company, the Ouest Algerian Company, the Franco-Algerian Company, and the Moktabel Hadid Company.

(1) The Paris-Lyon-Méditerranée Company (gauge, 1.44 meters) runs the line from Oran to Algiers (426 kilometers), and from Philippeville to Constantine (87 kilometers); total, 513 kilometers. This line was conceded in the year 1863, and interest at the rate of 5 per cent was guaranteed by the Government on a total capital of $15,440,000, which amounts to $772,000. The working expenses, also annually guaranteed, amount to $974,650. These lines are now self-supporting and are reimbursing the advances made by the Government.

The line from Algiers to Oran crosses a generally flat country, hilly only between Bon Medfa and Affreville. It intersects the plains of Metidja and Chetiff. The first-named plain is one of the richest tracts of land in Algeria, producing crops of all kinds, including cereals, oranges, grapes, wines, etc. The plain of Chetiff is also fertile, the principal production being cereals.

The Philippeville to Constantine line intersects a very uneven and undulating section of country, and has for a considerable length of time been the only available outlet from the interior for merchandise going seaward from the department of Constantine.

(2) The East Algerian Company controls the lines from Maison Carree to Constantine, 452 kilometers; El Guerara to Biskra, 201 kilometers;

Menorville to Tizi-Ouzou, 51 kilometers; Bougie to Beni Mansour, 88 kilometers; total, 792 kilometers.

These four lines were conceded at different dates between the years 1880 and 1884, while those to Biskra, Tizi Ouzou, and Beni Mansour were only completed during the year 1888. The guaranteed rate of interest is 5 per cent on a capital of $36,028,906, and amounts to $1,801,445.30. The amount incurred by working expenses is $1,093,336.

Algiers to Constantine, Menorville to Tizi Ouzou, and Bougie to Beni Mansour: The country traversed by these lines is very mountainous, but nevertheless very fertile, the principal productions being cereals, olives, olive oil, cork, and figs. Vine culture is also rapidly increasing.

El Guerara to Batna: The natural formation of the country through which this line passes is hilly, and the railway has been specially constructed to meet military requirements, and also with the view of connecting the splendid oasis of Biskra with the seashore. This oasis is very suitably situated for cultivating dates, and the area of land fitted for this purpose is being constantly augmented, principally through the beneficial effects of boring wells on the artesian system. Even now an extensive and lucrative commerce in dates is carried on.

(3) The Bone-Guelma Company control the following lines: Bone to Kroubs (gauge, 1.44 meters), 203 kilometers; Duvivier to Sidi el Henessi (gauge, 1.44 meters), 105 kilometers; Soukaras to Tebessa (gauge, 1 meter), 129 kilometers; total, 437 kilometers. These lines were conceded between the years 1876 and 1885. The branch line from Soukaras to Tebessa was only completed in 1888.

The rate of interest for the lines is as follows: Bone to Kroubs and Duvivier to Soukaras, 6 per cent; capital, $10,865,150; interest accruing, $651,909. Soukaras to Sidi el Henessi and Soukaras to Tebessa, 5 per cent; capital, $8,192,850; interest accruing, $409,642.50. The amount of working expenses, $614,022.75, and which are guaranteed.

All the lines controlled by this company run through a rich but very uneven country, the productions of which comprise cereals, cork, wine, alfa, etc. The junction with the Tunisian Railway system is at El Henessi.

(4) The West Algerian Company controls the following lines: Kelat to Ras el Ma, 151 kilometers; La Senia to Ain Temouchent, 80 kilometers; Talia to La Moriciere, 34 kilometers; total, 265 kilometers. These lines were conceded between the years 1874 and 1885.

The rate of interest for these lines: Kelat to Sidi bel Abbes and Taeia to Tlemcen, 5 per cent; capital, $5,131,190; interest accruing, $160,716; Sidi bel Abbes to Ras el Ma and La Senia to Ain Temouchent, 4.85 per cent; capital, $5,268,900; interest accruing, $255,541.65. The working expenses amount to $413,611.85.

These lines run, in some parts, through an exceptionally fertile country, producing principally cereals and wine, while in other parts it crosses very extensive alfa lands. For the year 1887 the amount of alfa produced in this region alone was 60,882 tons.

(5) The Franco-Algerian Company (gauge, 1.055 meters) controls the following lines: Arzew to Kralfalah, 214 kilometers; Kralfalah to Ain Sefra, 240 kilometers; Ain Thizi to Mascara, 12 kilometers; Mostaganem to Thiaret, 202 kilometers; total, 668 kilometers.

In the case of the line from Arzew to Kralfalah, no Government guaranty has been given, but in lieu thereof a land grant has been ceded amounting to 100,000 hectares for a period of ninety-nine years. This land should provide very favorable returns to the company, in the shape of alfa, which grows abundantly in this part of the country, including Mecheria, Saida, Mar, and El Aricha. The production of alfa from these districts for the year 1887 was 108,500 tons. That portion of the railway north of Perregaux runs through a tract of country producing, for the greater part, cereals.

(6) The Mokta to El Hadid line is 33 kilometers in length, and is the private property of the mining company of the same name. No guaranty of any kind given by the Government, the line having been specially constructed for the transportation of the iron ore from the mines to Bone. This line was only opened for passenger traffic on January 1, 1885. The Paris-Lyon-Méditerranée line is, up to the present, the only self-supporting system, and has commenced refunding the Government advances.

It is estimated that the other lines are not likely to be fully developed, from a commercial point of view, for at least ten years. During that period the different companies will be under the necessity of applying to the Government to make good the differences which may exist between the amount of their earnings and the amount required to meet working expenses and payment of interest on invested capital. After that lapse of time, and judging from the rapid increase of traffic, the probabilities are that the earnings will enable the companies not only to cover their working expenses but also begin the redemption of their debt to the Government.

To complete the Algerian railroad system the lines Oued Rhamour to Ain Beida and Blidah to Berroughia (gauge, 1 meter and 1.055 meters, respectively) are now under construction, and the following lines included in the general plan are being surveyed: (1) From Tlemcen to the boundary of Morocco; (2) from a point to be determined between Tlemcen and La Senia to the mining region of Rio Salado; (3) from Teney to Orleansville; (4) Affreville to Berroughia-Tremble and Bosdj Bouira.

Table A shows the exact terms of the Government. Table B shows the earnings for the years 1886 and 1887. It is to be particularly noted that the fall in the earnings for 1886 and 1887 was entirely due to the locust plague, which occurred in 1887, and when the statistics of 1888 are published the same fact will in all likelihood be repeated, cause and effect being due to said plague.

CHAS. E. GRELLET,
Consul.

ALGIERS, *March 21, 1889.*

TABLE A.—*Algerian railroads.*

Name of company and termini.	Length of line.	Date of concession.	Maximum capital guaranteed.	Rate of guarantee.	Minimum working expenses guaranteed per kilometer.	Amount of working expenses yearly guaranteed.	Amount of interest yearly guaranteed.	Total.
Paris-Lyon-Méditerranée:	*Kilometers.*			*Per ct.*				
Algiers to Oran	424.850	June 11, 1863	$15,440,000	5	.....	*a* $974,650.00	$772,000.00	$1,746,650.00
Philippeville to Constantine	87.850	.....do						
Est Algérienne:								
Algiers to Constantine	463.250	Aug. 2, 1880	20,267,123	5	$1,440.00	666,978.10	1,013,356.15	1,680,334.25
El Guerara to Batna	80.250	.....do	2,269,680	5	1,351.00	108,080.00	113,484.00	221,564.00
Batna to Biskra	121.250	July 21, 1884	5,595,056	5	965.00	116,765.00	279,752.80	396,517.80
Minerville to Tizi Ouzou	51.352	Aug. 23, 1883	3,265,047	5	1,440.00	73,935.20	163,252.35	237,187.55
Bougie to Beni Mansour	88.610	May 21, 1884	*b* 4,632,000	5	1,440.00	127,578.80	231,600.00	359,178.80
Oulad Ramoun to Ain Beida *c*	91.610	Aug. 7, 1885	1,975,355	5	965.00	87,815.00	98,767.75	186,582.75
Bone to Guelma:								
Bone to Guelma	88.042	Mar. 8, 1876 / Mar. 26, 1877	2,316,000	6	1,351.00	118,944.75	138,960.00	257,904.75
Guelma to Kroubs	114.712	Mar. 8, 1876 / Mar. 26, 1877	4,466,130	6	1,486.00	185,133.70	*d* 267,967.80	453,101.50
Duvivier to Soukahras	51.911	Mar. 8, 1876 / Mar. 26, 1877	4,083,020	6	1,486.00	90,547.55	*e* 244,981.20	335,528.75
Soukahras to Sidi el Henessi	52.773	Apr. 20, 1882	4,825,000	5	1,486.00	94,911.75	*f* 241,250.00	336,161.75
Soukahras to Tebessa	129.773	July 28, 1885	*g* 3,367,850	5	965.00	124,485.00	168,392.50	292,877.50
Ouest Algérienne:								
Kelat to Sidi del Abbes	51.572	Nov. 30, 1874 / Aug. 22, 1881	*h* 2,090,190	5	1,440.00	74,252.35	104,509.50	178,761.85
Sidi bel Abbes to Ras el Ma	100.012	.....do	*i* 3,281,000	4.85	1,440.00	144,150.80	159,128.50	303,279.30
Oran (La Senia) to Ain Temouchent	80.492	Aug. 5, 1882	*j* 1,987,900	4.85	1,351.00	108,744.70	96,413.15	205,157.85
Tabia to Tlemcen *k*	64.492	July 16, 1885	*l* 3,281,000	5	1,351.00	86,464.00	164,050.00	250,514.00
Blida to Berroughia *c*	84.492	July 31, 1886	*m* 5,211,000	4.85	1,254.00	105,378.00	252,733.50	358,111.50
Franco-Algérienne:								
Kralfalah to Mecheria	137.603	July 28, 1885	*n* 521,100	5	1,254.00	172,623.00	26,055.00	198,678.00
Mecheria to Ain Sefra	102.193	July 31, 1886	*o* 1,568,125	4.85	965.00	98,616.25	16,054.06	174,670.31
Thizi to Mascara	12.193	July 3, 1884	*p* 308,800	5	1,254.00	15,054.00	15,440.00	30,494.00
Mostaganem to Tiaret	202.193	Apr. 15, 1885	*q* 4,149,500	5	1,254.00	253,409.00	207,475.00	460,884.00
Total	.....	.....	94,900,876	.....	.....	4,828,517.70	4,835,622.51	8,664,140.21

a Annual average for fifteen years, 1872 to 1886, inclusive. *b* Including $150,455 for complementary accommodations. *c* Lines in course of construction. *d*, *e*, *f* Including $14,660, $13,402.58, and $16.485.94, respectively, for redemption of bonds. *g* Including $386,000 for complementary accommodations. *h*, *i*, *j*, *l* Including, respectively, $289,500, $289,500, $289,500, and $115,800 for complementary accommodations; according to the terms of the contracts the $984,300 thus obtained can be spent on the whole without limitation for any special line. *k* In course of construction; open to La Moriciere, distance 34 kilometers. *m* Including $386,000 for complementary accommodations. *n* Sum necessary to put the line in working order, building expenses between Modjbals and Mecheria having been paid by the Government. *o*, *p*, *q* Including, respectively, $57,900, $19,300, and $193,000 for complementary accommodations.

TABLE B.—*Algerian railroads.—Receipts, 1886-1887.*

Name of company and termini.	Total length of the lines working December 31, 1887.	Average length of the lines working during whole year.	Receipts, 1887.	Total length of the lines working December 31, 1886.	Average length of the lines working during whole year.	Receipts, 1886.	Difference between 1887 and 1886.		Per kilometer.					
									Total.		Difference between 1887 and 1886.			
											Total.		Per hundred.	
							Increase.	Decrease.	1887.	1886.	Increase.	Decrease.	Increase.	Decrease.
Paris-Lyon-Méditerranée:	*Kilos.*	*Kilos.*		*Kilos.*	*Kilos.*									
Algiers to Oran	426	426	$1,315,045	426	426	$1,268,587	$46,458	.....	$3,087	$2,980	$109	.....	$0.71	.....
Philippeville to Constantine	87	87	433,681	87	87	675,621	.....	$241,940	4,985	7,766	.....	$2,781	.....	$6.91
Total	513	513	1,784,726	513	513	1,944,208	.....	195,482	3,409	3,790	.....	381	.....	1.94
Est Algérienne:														
Algiers to Maison Carree	11	11	32,267	11	11	26,525	5,742	.....	2,933	2,411	522	.....	4.18	.....
Maison Carree to Constantine	452	452	589,337	452	382	598,745	.....	9,408	1,304	1,567	.....	263	.....	3.23
Minerville to Haussonvillers	27	26	27,366	15	6	7,830	19,536	.....	1,052	1,305	.....	253	.....	3.74
El Guerara to Batna	80	80	87,842	80	80	116,919	.....	29,077	1,098	1,461	.....	363	.....	4.80
Batna to El Kantara	65	60	40,866	33	14	8,723	32,143	.....	681	623	58	.....	1.80	.....
Total	635	629	777,678	591	493	758,742	18,936	.....	1,236	1,539	.....	299	.....	3.80
Bone-Guelma:														
Bone to Guelma	88	88	187,314	88	88	196,191	.....	8,877	2,129	2,230	.....	101	.....	.88
Guelma to Kroubs	115	115	94,437	115	115	102,424	.....	7,987	815	880	.....	65	.....	1.51
Duvivier to Sidi el Henessi	105	105	145,405	105	105	112,006	33,399	.....	1,385	1,066	319	.....	5.75	.....
Total	308	308	427,156	308	308	410,621	16,535	.....	1,386	1,333	53	.....	.74	.....
Ouest Algérien:														
St. Barbe du Kelat to Sidi del Abbes	51	51	202,188	51	51	191,485	10,703	.....	3,964	3,755	209	.....	1.08	.....
Sidi bel Abbes to Ras el Ma	100	100	131,392	100	100	130,696	696	.....	1,318	1,307	11	.....	.11	.....
Oran to Ain Temouchent	75	75	91,165	75	75	84,482	6,683	.....	1,216	1,126	90	.....	1.52	.....
Tabia to Ain Tellout	23	9	3,122	.....	.....	.....	3,122	.....	347	.....	347	.....	.....	.....
Total	249	235	427,867	226	226	406,663	21,204	.....	1,821	1,799	22	.....	.20	.....
Franco-Algérienne:														
Arzew to Kralfalah	214	214	364,522	214	214	290,373	74,149	.....	1,703	1,357	346	.....	4.93	.....
Kralfalah to Mecheria	138	138	83,393	138	138	52,216	31,177	.....	604	378	226	.....	7.65	.....
Mecheria to Ain Sefra	102	34	8,487	.....	.....	.....	8,487	.....	250	.....	250	.....	.....	.....
Ain Thizy to Mascara	12	12	10,693	12	1	1,258	9,435	.....	891	1,258	.....	367	.....	5.62
Total	466	398	467,095	364	353	343,857	123,248	.....	1,174	974	200	.....	3.96	.....
Mokta el Hadi Co.: Bone to Ain Mokra	33	33	12,717	33	33	12,016	701	.....	385	364	21	.....	1.13	.....
Total	2,188	2,100	3,861,239	2,019	1,910	3,876,097	282,431	297,289	1,839	2,029	.....	190	.....	1.80
Decrease	.....	.....	.....	.....	.....	.....	.....	14,858	.....	.....	.....	.....	.....	.....

THE PORT OF ALGIERS.[1]

As Algiers has become such an important coaling station for British vessels, an official description of the port may not be out of place. This has been published by the Chamber of Commerce in a lithographed volume, which, however, is not accessible to the general public. I subjoin an epitome of it.

This port, which consists of a single great sheet of water and a small basin, called the Darse, has a quadruple character:

(1) It is a military harbor. The Darse is entirely reserved for the marine and has several buoys in the south portion with a "stationaire" always present there. This portion of the harbor is not considered officially as a military port, but the minister of marine has issued orders for it being always kept for the use of the navy.

(2) It is a fishing port. There are 412 fishing boats, 3 of which are steamers, and 1,358 men are engaged in this industry.

(3) It is a harbor of refuge.

(4) It is a mercantile port, and takes eighth place among the harbors of France.

It ought, in the opinion of the Chamber of Commerce, to have a double future:

(1) As a port of repairs, if not of construction, as it contains two docks which are not yet sufficiently used.

(2) As a port of supply for English vessels going toward the East; in this respect it has wonderfully increased in importance of late.

The three first characters require a great surface of water; the fourth a great extent of quay. The surface contains 89 hectares (222½ acres), a superficies sufficient for its requirements, but the length of its quays is by no means equal to the demands of commerce. There are only 1,280 meters of quay available for a tonnage of 746,993 or 583 tons of merchandise for every meter of quay.

The commerce of the port of Algiers contains two items which greatly encumber the quays; the exportation of wine, which necessitates the return of empty casks, and the large stocks of coal which have to be kept up by the various firms engaged in supplying the vessels taking in coal here.

The following works are necessary to make the harbor as safe and commodious as it ought to be:

(1) The actual entrance should be narrowed and another one made in the south part of the mole. This work is estimated to cost 800,000 francs (£32,000), and is actually in progress.

(2) The crowning part of the northern jetty should be replaced by better work. This also is in progress, and will cost 340,000 francs (£13,000).

---

[1] Extracts from the annual report of the British consul-general at Algiers, March 20, 1894.

(3) The retaining walls of the admiralty "ilot" require to be renewed. A credit for executing this has not yet been granted.

(4) The northern jetty should be widened.

(5) The same jetty should be lengthened.

These two propositions have been approved by a nautical commission. But even these improvements are not sufficient for the requirements of the marine. The engineers are at present considering—

(6) A project for creating an inner harbor in the bay to the east. This is being taken into consideration by the competent authorities.

In the meantime, the chamber of commerce has solicited permission to erect sheds on the south terreplein of the fort, independent of anything that the Government may decide on doing, and it has purchased two new cranes for erection there. The railway company (Paris-Lyons-Méditerranée) has applied for permission to construct lines on the new quay for improving transportation around the harbor.

Lastly, the lighting of the port has been improved by placing two luminous buoys at the entrance.

Formerly, vessels going to and returning from the East used to stop at Gibraltar and Malta to coal. Now Algiers has been found a much more convenient stopping place, as it divides the distance better between Port Said and the United Kingdom, and it is free from the unusually strict quarantine regulations which frequently are enforced at our own Mediterranean ports. Two mercantile houses at Algiers, Burke & Delacroix and M. Prosper Durand, representing Strick & Co., of Cardiff, made great efforts to induce vessels to call here, and their success caused other firms to open branches at Algiers to participate in the business, the most important of which is Worms, Josse & Co.

TUNIS.[1]

The general shipping is mainly in French and Italian hands, the tonnage of the former amounting during 1893 to 1,026,685, and of the latter to 610,139. The chief points of call are Goletta, Tunis, Sfax, and Susa, which, together, monopolize more than half the tonnage.

Regular steamship communication with the ports of the Regency is kept up by the French Compagnie Générale Transatlantique, whose steamers ply between Marseilles and Tunis three times a week. They also make two weekly tours of the southern ports, the first starting via Malta and Tripoli, and the other in the reverse direction. These ships are subsidized by the French Government and have good passenger accommodation.

The other French companies engaged in the Tunisian trade are La Société Générale des Transports Maritimes, Compagnie de Navigation

[1] Extracts from the annual report of the British consul-general at Tunis, June 15, 1894.

Mixte, Compagnie des Bateaux à Hélice du Nord, and the Compagnie de Navigation Havraise Péninsulaire.

The ships of the Italian line (Florio-Rubattino) leave Genoa weekly, via Leghorn and Cagliari, for Tunis, the coast of Tripoli, and Malta; and for Palermo, via Marsala, Trapani, and Pantellaria, returning by the same routes.

The Danish steamers belonging to Det Forenede Dampskibs Selskab after calling at Antwerp, touch at Tunis monthly and proceed to the Piraeus.

The Austro-Hungarian Adria Line of steamers ply bimonthly between Trieste and Tunis, visiting Messina and Malta.

A Belgian steamship company has also lately started a regular monthly service between Antwerp and Tunis.

Gollcher & Sons, of Malta, have established regular steamship communication between that island, Trieste, and Tunis.

Knotts's Prince Line of steamers, referred to in my last report as having opened regular steamship communication between Great Britain and Tunis, will probably send boats this year from Manchester to Tunis every fourteen days, calling occasionally at Algiers. This arrangement will not interfere with their services to Hamburg, Antwerp, and Tunis, and to Antwerp, London, and Tunis.

The ships that entered the new Tunis Basin since the opening of the canal on June 1, 1893,[1] numbered 323 steamships and 225 sailing vessels, of 237,109 aggregate tonnage, with 70,842 tons of merchandise; the departures were 317 steamships and 223 sailing vessels, of 231,939 aggregate tonnage, with 31,632 tons of merchandise.

The Italian Steamship Company (Florio-Rubattino), which continued to load and discharge at Goletta, have now decided to take advantage of the new port, and made their first entry on April 23 of this year.

The completion of the works of the port has been confided by the Tunisian Government to Messrs. Alexis Duparchy and Simon Préault, a French firm, who have also undertaken to construct new ports at Susa and Sfax.

---

[1] The British consul-general at Tunis, in a report dated August 29, 1893, says:

"Tunis, hitherto known as an inland town, situated on a shallow lake, navigable only by small craft, has now become a seaport by the construction of a canal through the lake, placing it in communication with the Gulf of Tunis. The undertaking was started in 1855 by La Société des Batignolles, and was sufficiently completed this year to open the port to navigation. The formal inauguration took place on May 28, in the presence of the Bey, the French resident, the foreign representatives, and all the civil and military authorities of the place. Ships belonging to the French and Austrian lines have since then entered the Tunis Basin regularly, but the Italian Rubattino Line of steamers and many other vessels continue to load and discharge at Goletta.

"A submarine telegraph cable was laid in the commencement of this year between Marseilles and Tunis, and opened to the public on February 19. The cable passes close to Bizerta, but has not yet been landed at that port."

According to the terms of the concession, the Tunisian Government has made over to the concessionaires the three ports, with all their movable and immovable appurtenances.

The capital of the company will be £120,000, which may be increased by order of the Government to an additional equivalent sum. The caution money is fixed at £40,000, to be deposited in the Tunis treasury as security for the completion of the works.

On the other hand, the Government guarantees an annual revenue from the ports of £16,200, to be paid from the completion of the works at each port in the following proportion:

Port.	Value.	
	£	s.
Tunis	5,443	4
Sfax	7,646	8
Susa	3,110	8
Total	16,200	0

The right of sale of a portion or the whole of the land is reserved by the Government, the concessionaires obtaining one-third and the Government two-thirds of the proceeds.

THE PORT OF BIZERTA.[1]

Bizerta is a port of Phœnician origin, and was formerly called Hippo Zaritus, distinguishing it from Hippo Regius, a port existing at the time in proximity to the site of the present Bone in Algeria. The place fell into the hands of the Arab conquerors of north Africa in 662, and on the expulsion of the Moors from Spain in 1492, many emigrants settled in the town, and founded a quarter which still bears the name of Andalous. When Charles V of Spain invaded Tunis, in 1535, Bizerta was occupied and strongly fortified, and it was subsequently bombarded, in the eighteenth century, on several occasions by the Venetian fleets. From that period up to the French occupation in 1881, the port remained in comparative obscurity.

The first improvements were undertaken on a small scale by the Government of the Protectorate in 1886. At that time, the lake was connected with the sea by the ancient channel, which passed through the town, dividing it into three sections and giving it a quaint and picturesque appearance. The anchorage in the harbor was unsafe, owing to its exposure to the north and northeast. There was only about 3 feet depth of water in the canal, the entrance was choked with sand, and the quays were in a ruinous state.

It was not until 1888 that the project of opening up the Great Lake by a shipping canal and of erecting a new port at the entrance was entertained by the Government. The undertaking was confided to

[1] Extracts from report of British consul-general at Tunis, August 25, 1894.

Hersent & Couvreux, in 1889, who obtained a beylical concession in the following year and formed the Bizerta Port Company, under their personal direction.

The construction of a railroad to connect the port with the city of Tunis by a branch from Djedeida, on the Medjerdah main line, was commenced in 1893 by the Bone-Guelma Railway Company, and is now far advanced toward completion.

Unlike other ports of the Regency, Bizerta is situated in a mountainous district, well adapted to European colonization, both in point of climate and agriculture.

The Arab town lies on the northern slopes, above the old canal and port; below it, on the land acquired by the port company through the filling up of a large portion of the old channel and of the shallow waters of the borders of the lake where the fisheries formerly existed, an European quarter is in course of development on a predevised plan of the company.

The entrance to the new canal is about three-fourths of a mile to the southeast of the old channel, and the outer harbor will be protected from all weathers, as well as from an accumulation of sand, by the construction of two solid stone breakwaters, called the northern and eastern jetties. The former has now attained its full length of 1,090 yards, and the latter, already well advanced, will be about the same length when completed, affording a passage from the sea about 416 yards wide. The area thus inclosed by the two breakwaters will measure 1,000 square yards, with a good anchorage for ships of large draft.

The cutting of the canal, about 1 mile in length, traverses a low and sandy tract of land in a straight line with the entrance from the sea and a headland in the lake called Sebra, where a light-house will be erected, which will considerably simplify the navigation of the canal at night.

The quays now being constructed are situated at the lake end of the canal, close to the railway terminus, and at a short distance beyond them, on the same side, is the spacious bay of Sebra, with from 3 to 4½ fathoms of water, affording excellent anchorage for shipping.

The approach to the lake from the canal is about 5 miles in length and varies from one-half to 1 mile in width, resembling in many respects a Scandinavian fiord. The whole lake measures about 36 miles in circumference, covering a surface of about 12 square miles, and has from 6 to 7 fathoms depth of water, extending without interruption from the port throughout a considerable portion of the lake, up to its southern shores, where it is connected by the River Tinja with Lake Ishkel. The river is about 3 miles long, and navigable only by vessels of light draft. During the greater part of the year the level of Lake Ishkel is above sea level at Bizerta, but the evaporation that takes place in the dry season causes a fall in its waters and conse-

quently a change in the flow of the river. On the southeast side of the lake, rising abruptly from its marshes, is the hill of Djebel Ishkel, with an altitude of about 1,500 feet, thickly wooded on the lower slopes but bare and rocky near the summit.

The railroad, after leaving Djedeida, passes through a fertile district to the town of Mateur. From thence it skirts the hill of Djebel Ishkel, and after crossing the River Tinja follows the western shores of Lake Bizerta up to the new port.

Bizerta, with its railroad and fine harbor, will undoubtedly attract in due course of time a certain portion of the trade of northern Tunis, and its exceptional position in the Mediterranean will probably enable the Bizerta Port Company to realize their project of establishing a convenient coaling station for the numberless vessels that annually pass in proximity to the port, on the highway between the Straits of Gibraltar and the East.

OTHER RAILROAD ENTERPRISES.[1]—The convention between the Tunisian Government and the Bone-Guelma Railway Company for the construction of the several lines connecting Tunis with the principal southern seaports and Kairwan is still awaiting ratification by the French Parliament. This has been the chief cause of the long delay in the realization of these promising schemes for the development of the rich resources of the country.

TRIPOLI.[2]

Nothing remarkable has taken place in shipping at this port during 1894. The total number and tonnage and class of vessels which visited the place have been much the same as in former years, and the countries whence they arrived and to which they departed have not differed; only the relative positions of two nationalities have changed. Whereas French shipping hitherto headed the list as having the largest tonnage, it is Italian shipping which now occupies the foremost place, and this position which the latter has acquired is not likely again to be reversed for some years to come. This change, however, does not necessarily imply that the carrying trade is greater under the Italian flag. It is due simply to the fact that nearly all the French vessels which are in the habit of calling here have lately been remeasured, whereby a considerable reduction was made in their tonnage. As far as cargo is concerned, not much is conveyed in either French or Italian vessels, which, being nearly all subsidized mail steamers, sailing under restrictions which do not permit of their making long stays at this port, have no special object in securing it.

---

[1] Extract from British consular report of June 15, 1894, previously quoted.

[2] Extracts from annual report of British consul-general at Tripoli, March 26, 1895.

The British steamers of the Prince Line, which first touched these shores in 1893, continued to pass by this port on their way to the Levant, but it is uncertain whether they will be able to secure sufficient freight to induce them to follow the same route in the future. Malta is so close at hand and in such frequent communication with London and Liverpool, that merchants find it more convenient and expeditious to have their goods sent through that island, although they have to be transshipped, than by steamers coming here direct.

Nothing of importance has been undertaken under the head of public works except, perhaps, the construction of a low embankment or quay along the east beach outside the city walls. It is of no use to shipping, as even boats can not get alongside; but when completed, will, if strong enough, protect the shore from the encroachments of the sea, and serve as a sort of promenade for pedestrians.

CARAVAN TRADE.

The year was disastrous for the caravan trade and all interested therein. In former years troubles in the interior were not uncommon, but they were more or less of a local character, and rarely assumed serious proportions or obstructed the routes for any lengthened period. Information relative to caravans was always obtainable, but this time, owing to the gravity of affairs in Bornu and the extent to which disturbances spread, none was forthcoming for ten months, and at present nothing positive is known. Since September, 1893, when the first news of Rabah's occupation of Baghirmi, situated to the south of Bornu, was received, trade fell off; but as people could not forsee the course events would take, they continued to dispatch caravans to those regions, though with less goods than formerly. Rabah, however, did not stop at Baghirmi, but invaded and overran Bornu, the routes to which country were in consequence closed. Tripoli traders who happened to be there at the time with all their stock in trade, having sided with the Sultan of Bornu against Rabah, were, on the defeat of the former, either killed or deprived of their property, the few who escaped finding their way to Wadai, whence they are expected to return here via Benghazi. The greatest portion of the trade of Tripoli with the interior being with Bornu, these events caused much consternation among merchants, who at once abandoned all intentions of equipping more expeditions to that country and suspended others to Wadai. The Ghadamses also, who are the oldest and most enterprising in this trade, were discouraged, and did not transact one-tenth the amount of their usual business. Caravans which left Bornu, the Soudan, and Wadai before the troubles broke out arrived here safely, but no others have since followed.

The following extracts from the report of the British consul general at Tripoli, March 24, 1892, give some additional particulars as to the caravan trade.

"The trade routes have remained comparatively undisturbed, only occasional rumors of difficulties having reached Tripoli, but nothing calculated to prevent the free circulation of caravans. From Tripoli to Fezzan the road is at all times practicable, as the Turkish authorities maintain a certain amount of control over the Arabs; but wells are not so frequent, as from Fezzan to the Soudan, the longest march without wells being about five days. The progress of a caravan after leaving Tripoli does not exceed 12 miles per day, the journey from Tripoli to Ghat taking generally seven to eight weeks, and from Ghat to the Soudan ten to twelve weeks. During the desert part of the journey the food carried is mostly paste made of pounded dates; but as supplies of food are obtainable at short distances no great quantity either of food or water is carried.

"The caravan trade is carried on by two classes of merchants, the most important being Ghadamsi, an intelligent and business-like tribe of Arabs, and the wealthiest of the native Tripoli merchants. Their operations are confined principally to Ghat and the Soudan. The Arabs are the least important traders. They handle principally goods intrusted to them by Jewish and European merchants of Tripoli, and have their principal trade with Bornu.

"Under normal conditions caravans arrive at and leave Tripoli in small numbers, varying from 40 to 100 camels, between April and October, and during the same months from Ghat and Mourzouk to and from the interior, but in times of tribal disturbances only one or two departures take place, of 500 to 700 camels, at the beginning and end of summer. As a rule, they are fairly well provided with Winchester repeating rifles, and it is an exceedingly rare occurrence that even a small caravan is attacked and pillaged, and never a large one; but, on the other hand, the risk of crossing any belt of country considered dangerous is not often undertaken, the Arabs preferring to wait even months until the road is safe.

"Ghat is an important intermediate center between Tripoli and the Soudan, where a great amount of interchange of goods takes place, and it is the real point of arrival and departure for the Soudan. Camels are, in most cases, exchanged there, the whole journey rarely being completed with the same set, unless in times of scarcity, when they are allowed to rest one or two months before resuming the journey.

"On leaving Ghat, the road lies across a stretch of country sparsely populated by Arab tribes, mostly Toaregs. Here guides are taken by caravans, and a toll is exacted by the various chiefs for permission to pass unmolested through their territories, and for affording protection to the boundaries of the neighboring tribe. This process is repeated many times before arriving at Kano, one of the main resting places for the caravans. It is a town with a numerous black population, ruled by a native chief, who, in consideration of certain presents and

tolls, affords shelter and protection. Here, on arrival, quarters are taken up by the Arabs and goods opened for sale and native products bought. The length of stay, varying from six to twelve months, depends upon the scarcity or otherwise of native products. A rude currency, consisting of strings of small shells, of different values, is much used, also a few Maria Theresa dollars, but bartering is most frequent. From this point some few Arabs make their way to Sokoto and Timbuctoo, but the trade they do is not important."

EGYPT.

The special features of transportation as regards Egypt are the great River Nile, the Suez Canal, and the caravan system. The Nile, flowing from equatorial regions and emptying into the Mediterranean, with an estimated course of over 4,000 miles, is navigable for small vessels for the greater part of its length, and is, of course, an important feature in the internal communications of Egypt and the great equatorial regions.

In a report to the Department, dated June 11, 1890, printed in Special Consular Reports, "Canals and Irrigation," pages 255 to 278, inclusive, Consul-General Schuyler, of Cairo, gives an interesting description of the Nile, with more particular reference to the system of irrigation employed to fertilize its basin. Egypt, or, more strictly, the cultivable land in Egypt, he says, is composed of two parts, the Nile Valley and the Delta. The long narrow valley of the Nile, extending in a general direction north and south for 559 miles from Assouan to a few miles north of Cairo, is scarcely wider in any place than 15½ miles, and once or twice draws close to the river, but has an average breadth of 7½ to 8¾ miles. This is called Upper Egypt, and contains about 2,400,000 acres of cultivable land.

Among the Libyan Mountains, about 56 miles south of Cairo, is an opening, and beyond this a depression, in circular form, about 25 miles in diameter, called the Fayoum. It is watered by a canal brought from the Nile. In one part of it, in old times, existed what was known as Lake Moeris. The cultivated land in the Fayoum amounts to 220,000 acres, besides which there are 60,000 acres more that could be reclaimed. This oasis forms a part of Upper Egypt.

Just north of Cairo the river divides. Formerly, there were seven main branches, but now there are only two, although the older ones are to some extent represented by canals. A triangle of cultivable land is thus formed, about 100 miles long by 87½ miles at the base on the seashore. This is called the Delta, or Lower Egypt, and contains a cultivable area of 4,000,000 acres, 274,000 of which are at present cultivated and pay taxes.

The bed of the Nile is a trench cut into the strata of mud which it has brought down for so many years. Sometimes, for a long distance,

it is quite straight; at others it is tortuous, and it frequently changes its course. The width of the river is variable. At low water it runs between sharply cut banks and shoals of sand and mud, and is often divided into various channels. After midwater the river is about even with its banks, varying in width from one-third of a mile to 1¼ miles, and is even separated into branches by islands, sometimes several miles long. It is narrowest opposite Cairo, where the width is reduced to about 787 feet. At high water, especially during a great rise, it would cover the entire valley were the land not protected by dikes running the whole length of the banks of the river. The branches of the Nile, which include the Delta, have very much the same irregularities as the main stream. During the ten years from 1872 to 1881, the level of the lowest water varied between 276 feet 5 inches, and 285 feet 3 inches above the Mediterranean, giving an extreme variation at lowest water of 8 feet 10 inches. During the same time the highest flood levels varied between 300 feet 1 inch and 309 feet ½ inch, showing an extreme difference of 9 feet ½ inch.

THE SUEZ CANAL.

This great ship canal, connecting the Mediterranean with the Red Sea, extends from Port Said on the former to Suez on the latter, a distance of 87 miles. Of this, 66 miles are actual canal and 21 miles lakes. The canal is without locks. It was opened for navigation November 17, 1869, a little over ten years from the commencement of construction by a company organized by the French engineer Ferdinand de Lesseps. The total cost of construction was nearly £16,000,000. Originally, for about four-fifths of its length it was 327 feet wide at the surface of the water, 72 at the bottom and 26 deep. For the remainder it was 196 feet wide at the surface of the water, the width at the bottom and the depth being the same. But in recent years it has been widened and deepened in order to meet the requirements of the immense traffic passing through it. A canal was also built to bring fresh water from the Nile at a point near Cairo. This canal reaches the salt water canal at Ismailia and then runs almost parallel to the ship canal to Suez. It is about 40 feet wide and 9 feet deep, and is used for navigation as well as for irrigation. In 1875 the British Government bought the interest of the Viceroy of Egypt in the canal.

The building of the canal shortened the distance between London and Bombay by the old route around the Cape of Good Hope from 11,220 miles to 6,332 miles. It may be said that the trade of the world passes through the canal, and the shipping using it is steadily increasing. On March 1, 1887, navigation at night was begun by means of the electric light, shortening the time of passage about one-half, or to about sixteen to twenty hours.

A report from Consul-General Penfield, at Cairo, February 9, 1895, published in Consular Reports for April, 1895, page 589, says:

During the year 1894, the number of vessels passing through the Suez Canal was 3,352, being 10 in excess of the preceding year, and the receipts from tolls amounted almost to $15,000,000. The number of ships using the canal in 1874—twenty years ago—was only 1,264. These figures, compared with those of the present day, show how completely the canal has revolutionized the channel of traffic between the Far East and Europe. The largest business year the canal has ever had was 1891, when 4,206 steamers passed through. The application of the electric light to marine purposes is now so general that nearly 95 per cent of the vessels using the canal last year were enabled to steam at night. Not one mercantile ship flying the United States flag entered the canal last year, although many cargoes destined for America passed through in British ships. The detailed record of the traffic in 1894 is appended:

Nationality.	Steamers.	Net tonnage.	Traffic receipts.	Nationality.	Steamers.	Net tonnage.	Traffic receipts.
American	*a* 5	3,001.71	$4,826	Spanish.....	28	82,269.52	$157,534
Austrian	78	178,998.64	340,200	Turkish	33	39,395.56	107,492
British	2,394	6,009,902.98	10,948,074	Japanese	6	12,103.56	22,790
Dutch	188	352,451.28	653,400	Portuguese ...	2	672.29	1,217
French	184	463,430.93	891.380	Egyptian	1	810.28	1,468
German	294	624,555.18	1,139,985	Guatemalan ..	1	145.02	263
Italian.....	63	119,084.93	200,861				
Norwegian	40	65,862.71	117,833	Total ...	3,352	8,039,105.97	14,770,081
Russian	35	77,421.38	162,938				

a War ships and yachts.

The report of the British consul at Port Said, July 13, 1894, says the percentage of ships using the electric light to pass through the canal has been, in 1890, 83 per cent; 1891, 88 per cent; 1892, 90 per cent; 1893, 92 per cent. The average time occupied in passing through the canal was, in 1893, with the electric light, nineteen hours fifty-two minutes; without the light, thirty-one hours, twenty-four minutes. The time occupied in transit is slowly but steadily decreasing. Out of the 3,341 ships which passed through the canal in 1893, 2,300 had a draft of under 23 feet 4 inches; 985 drew between 23 feet 4 inches and 26 feet; 56 had the maximum draft of 26 feet.

HIGHWAYS-

In a report from Acting Consul-General Grant, of Cairo, April 9, 1891, published in Special Consular Reports, "Streets and Highways," page 538, the following information is given as to the roads of Egypt:

In the several towns of Egypt, except Cairo and Alexandria, there are very few metaled roads. The others are merely beaten earth kept wet and smooth, and considering the climate and the smallness of the traffic, they answer sufficiently well. Until two years ago, it may be said there were no country roads at all, and it would have been impossible to convey agricultural products on a wheeled cart from one center of population to another. A beginning has been made, first in Dakahlieh and in Sharkieh, and then throughout the other provinces, of constructing simple unmetaled roads, 5 meters wide, with bridges over canals, leading generally to railway stations and sometimes to points on the river. Their construction is being defrayed by a local tax not exceeding 20 or 25 cents per acre for one year only. They are to be maintained at Government expense. It is too soon to pronounce on the value of these roads, but they are very popular among the people.

RAILWAYS.

The Statesman's Year Book for 1895 gives the total length of the railway system of Egypt as being 1,255 miles, with 30 miles under construction. The telegraphs belonging to the Egyptian Government, according to the same authority, were, at the end of 1892, of a total length of 1,922 miles, the length of the wire being 6,763 miles. The Government has also established telephone communication between Cairo and Alexandria, and has given concessions to a telephone company for urban telephone lines. The Eastern Telegraph Company also by concessions has telegraph lines across Egypt from Alexandria, via Cairo, to Suez, and from Port Said to Suez, connecting their cables with England and India.

United States Consul-General Cardwell, of Cairo, in a dispatch of January 10, 1887, published in Consular Reports, September, 1887, page 727, says the first railway built in Egypt was that between Alexandria and Cairo in 1845. Its purpose, besides connecting the two great cities of Egypt, was to form part of the railway line between Alexandria and Suez, now partially disused, because of the opening of the great interoceanic canal across the Isthmus of Suez. The railway system has now been considerably extended, so that it embraces connections between all important points in the Delta, as well as between Cairo and the Fayoum and Assioot. There are no viaducts, tunnels, etc., and only two very expensive bridges, which span the two branches of the Nile, on the Alexandria-Cairo line.

The mode of construction is by raised earthen roadbeds only a few feet high, upon which are laid cast-iron chairs resembling huge overturned saucers, separated by transverse round bars firmly fastened to the chairs. Two chairs thus connected form the parallel ties and the rests for the rails, and the iron way thus formed is as solid and substantial as though laid on live oak ties firmly ballasted in rock.

In a subsequent report, of June 16, 1888, published in Consular Reports, July, 1888, page 60, Mr. Cardwell says the railways and telegraphs of Egypt were built by the Government. They belong to the Government and are operated by it under the direction of three commissioners. Besides the railways and telegraphs, the commission has attached to its administration the port of Alexandria.

The recent development of the railway service of Egypt is given in a report from Consul-General Penfield, of Cairo, dated April 6, 1895, as follows:

> In no way is the industrial progress of Egypt better illustrated than by the present development of its railway system. Railway building is not a recent innovation in the ancient land of the Nile, however, as the first line—from Alexandria to Cairo—dates from 1852; and five years later, the English engineer, Robert Stephenson, completed rail communication between Alexandria and Suez, making the "overland route" to India as practicable for freighting as it had been for passenger traffic. This is now almost wholly superseded by the great canal of De Lesseps.

It is said that Egypt, in proportion to populatiou, has more railway mileage and better service than Austria, Hungary, Spain, or Portugal. All railways are Government property, with the exception of a short suburban road from Alexandria along the Mediterranean to Ramleh, a 15-mile line connecting Cairo with the health resort of Helouan, and a steam tramway on the bank of the Suez Canal, joining Port Said with Ismailia. These private enterprises, as well as the Government lines, are very profitable. The income of the latter is pledged to certain European creditors of the country, as a partial consequence of the extravagance of Khedive Ismail.

A net work ofrails spreads over most of the Delta, and the main line has for two or three years extended southward in the Nile Valley to Girgeh, 336 miles from Cairo. Two years hence, the road will be completed to Keneh, 66 miles farther south; and contracts have just been signed for carrying it to Assouan, the frontier town of Egypt, at the first cataract of the Nile, and 710 miles from the Mediterranean. This terminus is expected to be reached in time for the Upper Nile tourist traffic of 1897–98.

The moderate speed at which all trains are driven, save the expresses, and the cheapness of native labor, permit the working expenses to be kept much below the European average. A level country with frosts and violent storms unknown, makes railway construction a simple matter. Rock blasting, tunneling, excavating, and trestle building are practically unnecessary. Bridging the Nile, however, is expensive. The present cost of construction in the Delta, where bridges over irrigating canals are numerous, averages $28,000 per mile of normal gauge; but in Upper Egypt the cost is not more than $25,000. The narrow-gauge (1 meter) extension from Keneh to Assouan is to cost only $12,500 a mile.

Most of the locomotives come from Belgium, and the first-class passenger cars from England. Rails are also supplied by England, and bridge work by Belgian and French firms. Most of the engineers and firemen are natives, the former receiving from $30 to $75 per month and the latter from $12.50 to $20 per month; the few European engineers employed average $100 a month. The railways are managed by an international administrative board of three, the chairman of which is an Englishman. The others are, respectively, French and Egyptian, and heads of departments represent nearly every European country. Sealed tenders for all materials are invited from English and other European industrial centers, and the most advantageous offers accepted.

The appended statistical table gives information valuable to anyone interested in railway economics. The enormous increase of passengers carried, the reductions in passenger and freight charges explaining the small increase of receipts, is specially worthy of notice:

Year.	Total receipts.	Passengers carried.	Mileage open to traffic, without sidings.	Per cent of operating expenses to receipts.
1888	$6,350,000	4,004,882	944	45
1889	6,505,000	4,378,453	946	44.9
1890	7,040,000	4,696,286	961½	43.3
1891	8,155,000	5,612,562	961½	43.3
1892	8,400,000	7,047.295	1,000	43.3
1893	8,095,000	9,301,081	1,081	43.2
1894	8,870,000	9,827,813	1,088	43.2

Street railways with electric traction are promised for Cairo next year, the concessionaires being Belgians; and Alexandria is expected soon to follow suit. There are several bidders for a concession for an electric tram line from Cairo to the Pyramids, a distance of 10 miles, to accommodate the enormous number of winter visitors to the capital. The Egyptian ministry recently had from a Frenchman a serious application for permission to build a "funicula" railway to the top of the Great Pyramid. The request was not taken into consideration.

STEAMSHIP LINES, CARAVANS, ETC.

The following report by Consul-General Penfield, dated October 23, 1893, printed in Consular Reports, January, 1894, page 205, furnishes information as to the steamship lines and caravan trade:

Favored to a remarkable degree for direct shipments from every European country of importance, it is regrettable that Egypt can not thus avail herself of American products and manufactures, which explains why Great Britain, France, Germany, and Austria enjoy almost a monopoly of Egypt's growing trade. Direct and regular steam communication with the United States would unquestionably secure a ready market in Egypt and other Mediterranean countries for many articles the outcome of American soil and manufacturing genius.

The route most used at present for shipments to Egypt is by way of Liverpool, from which port to Alexandria the Cunard, Moss, and Papayanni lines maintain regular services, while from Hull and other English ports the Leyland Company dispatches steamers periodically. From London the important Peninsular and Oriental, Orient, and British India companies weekly send steamers to Alexandria or Port Said, and the Anchor and Clan lines from Glasgow bring freight to Port Said and other Suez Canal stations.

A much-used route for freight from New York is that to Marseilles by the Fabre Line, with transshipment to Alexandria by the Messageries Maritimes Company. The North German Lloyd steamers to Genoa connect at that place with the Peninsular and Oriental boats for Alexandria, and in the winter season this company sends several of its best vessels direct to Alexandria. Shippers are hoping that the company will soon feel justified in maintaining regular communication throughout the year between the United States and Egypt.

Almost the only direct shipment from the United States is petroleum in chartered sailing ships, which sometimes pick up a cargo of cotton or rags for the return voyage.

Goods are usually landed at Alexandria direct from the vessel, but lighters are frequently employed. Alexandria has commodious and modern docking facilities. Vessels passing through the Suez Canal have no fixed rule for landing freight at Port Said, Ismailia, and Suez; but lighters are generally made use of in conveying goods to the customs sheds.

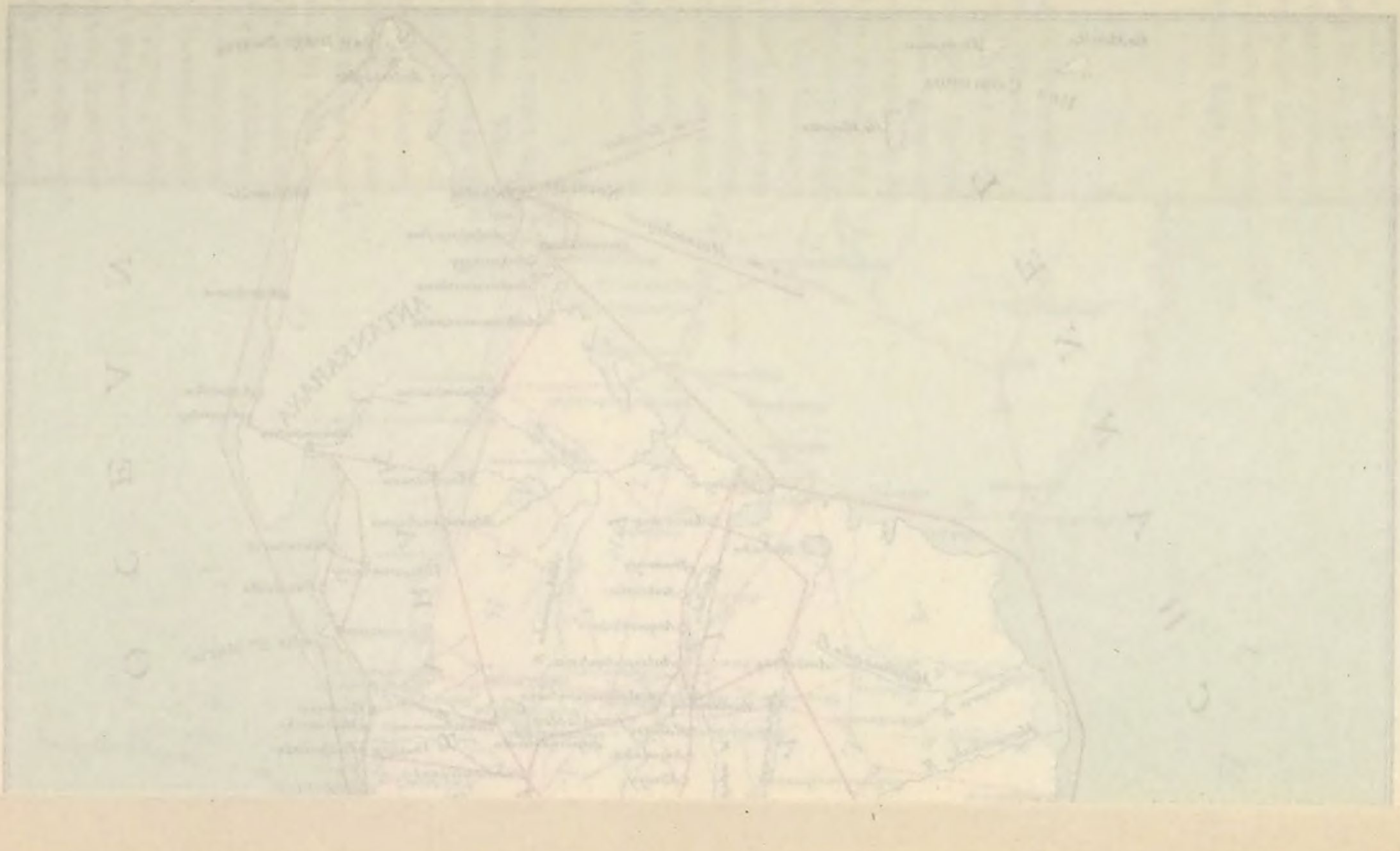
At Alexandria and the canal ports there are well-equipped warehouses, and merchandise is seldom exposed to the elements. It should be borne in mind that rain rarely falls in Egypt, and frost is practically unknown.

Goods for Cairo and places in the Delta and for important towns in the Nile Valley as far above Cairo as Ghirgeh are carried by the governmental lines of railway and are subject to about the same treatment as in other countries. If shipments are destined for the interior and remote districts in the direction of the Soudan and between the Upper Nile and the Red Sea, where the only transport is by camel caravans, packages should not weigh more than 300 pounds, the size being practically immaterial.

PROVINCE OF SUAKIN.[1]

As regards the history during the past year, I have again to report that the country was disturbed by raids at the commencement of the year, and that trade with the interior during the first three months was very insignificant. After the month of March, the Berber road was open, and, throughout the year, caravans passed regularly to and fro.

[1] Extracts from the annual report of the British consul at Suakin, March 21, 1894.



Map of MADAGASCAR in 1894, Showing Land and Water Routes of Travel.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

Seventeen steamers represented the total of British shipping which entered the port during the past year. These were the Bombay and Persian Gulf boats with general cargoes. To these I add two steamers belonging to the Eastern Telegraph Company. The Khedivial Steamship Company continues its fortnightly service from Suez, but it is much to be regretted that the state of trade does not permit some other company to enter into competition with them, for their freight rates are exceptionally high, and their accommodation none of the best.

MADAGASCAR.

Owing to the peculiar conditions surrounding the commercial life of this great island, this subject, "The highways of commerce in Madagascar," can not be discussed analytically. Madagascar has neither canal nor river navigation, neither railway nor roadway systems or lines as these terms are understood in civilized communities. Even such ocean steamship lines as periodically enter these ports may at any moment be withdrawn. The conquest of the island by France would ere long drive the English line to seek other ports, while the failure of France in her Madagascan operations would result in the withdrawal of the French line from all ports not directly under French dominion.

The appended outline map will show all of the main traveled routes, whether water or foot-trail, both through and around the island, by which the commerce of the interior comes down to the coast, and returning distributes that of the coast.

INLAND ROUTES OF TRAVEL.

The inland water navigation is carried on exclusively by native dug-outs or canoes. The inland routes of travel outlined in red upon the map also embrace all the inland water navigation of the island, which may be said to be but an adjunct to the regular method of transportation in Madagascar, and these routes are those usually traveled by the borozans, or porters, whether of persons, or feight, in journeying from and to the points indicated. Often it is but a trail wide enough for two men to walk abreast; again, a series of such trails, side by side. Here and there, short cuts occur, made by nimble or erratic feet; usually the trail goes winding on unbroken, save by natural obstacles. Of course there are innumerable villages on all these routes, hamlets of but a few thatched huts; again, large and populous towns, commonly used as stopping places, or way stations; and many rivers and rivulets, lakes, and bodies of water, occur, none of which appear upon the map. For instance, from Tamatave, down the coast southward, almost to Manakara, extends a chain of lakes, or lagoons, from one-half a mile to 3 miles apart. Across these rivers, up and down these lakes and

bodies of water, the native canoe is the ferry and assists in the transportation of freight and passengers. Each canoe is furnished with a steersman, but the passengers must do the paddling. No European has, as yet, made the journey from Ambohimandrose to Fort Dauphin in the south, although the natives have a regular highway, said to be constantly used by them between these places; hence, the route is only indicated by dotted lines.

The carriage of freight and passengers is done exclusively on the shoulders of men. Packages of freight, when very heavy, require a very large number of porters. An average porter's (borozan's) load ranges from 60 to 80 pounds for constant traveling, although some men carry as high as 120 to 150 pounds each. Passengers are carried in a kind of seat slung between two poles. Each passenger (adult) needs four or more porters, and, in rough or heavy country, eight or more. Where the passenger weighs over 180 pounds a still larger number of porters is requisite. Beasts of burden are practically unknown in Madagascar, men being used exclusively in their places; and as this has been going on for generations the porter, or borozan, is readily distinguishable by the hump, or roll of callous sinew, this kind of carriage has developed, to a most remarkable degree, on the back of his neck, over and between both shoulders, near the neck-base.

RAILWAY POSSIBILITIES.

The engineering difficulties to be overcome in constructing a railroad up to and across the central plateau from the east coast are said to be simply appalling, but from the west coast, although in places it will be a difficult undertaking, the prospect can not be said to be disheartening. For a railway around the coast, east or west, there are but few engineering obstacles of any gravity. The mountains, except in isolated places and in the northern peninsula, are fully 20 to 30 miles inland on the east and 60 to 100 miles inland on the west coast, with an undulating plain of partially timbered and grass lands extending to the coast line.

NAVIGABLE RIVERS.

Nearly all the rivers are navigable for small craft up to the mountain ranges and many for a much greater distance. The sand bars at their mouths render them, in nearly all cases, inaccessible for shipping. The Betsiboka River on the west coast and its tributary, the Ikopa, on which rivers lie some of the finest rice fields in the world, are navigable for dhows and small schooners as far up as Maevatanana (in the rainy season), and from thence to Suberbieville, some 5 miles up the Ikopa River. Until recently I have been informed, a 60-horsepower steamer and two schooners plied regularly between Majoriga and Suberbieville. It is asserted that these rivers are navigable for small boats to within four days foot travel of the capital, Antananarivo, thus making them navigable for, say, 180 miles.

OCEAN LINES.

There are two steamship lines which have practically become identified, to some extent, with Madagascan commerce, and are therefore entitled to especial mention.

The Castle Line.—The intermediate steamers of the Castle Line of mail packets, also called the Donald Currie line, touch at Tamatave from Natal every four weeks. These boats call at Fort Dauphin, Mananjara, Mahanora, and Tamatave, and thence proceed to Port Louis, Mauritius, returning from there direct to Natal, after a ten days' trip, unless sufficient freight or passage returns offer on the Madagascan coast to warrant their calling for same en route to Natal.

The fleet and tonnage of this line usually placed on the Natal-Mauritius run comprise the *Pembroke Castle*, 3,878 tons; *Doune Castle*, 2,957 tons; *Methven Castle*, 2,605 tons; *Dunbar Castle*, 2,608 tons; and *Warwick Castle*, 3,056 tons.

The agents of this line in Madagascar are either loath or unable to give any definite information concerning it. The general condition of the line is good, and it is being constantly bettered both as to equipment and service. The passenger tariff to London is $262.50, first class; $183.75, second class, and $131.25, third class. Intermediate tariffs I have been unable to secure. The freight rates are from $7 to $10 per ton to London and $15 to $20 per ton of 2,000 pounds to Boston or New York. There is no freight traffic between Madagascar and South Africa, therefore no rates can be given. Freight charges between coast ports vary, ranging from $5 per ton upward.

This line is a private English corporation engaged principally in the South African colonial trade, the Madagascar-Mauritius branch being, therefore, practically a subsidiary line. The parent line, including these intermediate steamers, receives a certain subsidy from the British Government for mail service to South Africa. I have been unable to learn what arrangement they have for Madagascar and Mauritius.

The Messageries Maritimes Company.—The regular mail steamers of the Oriental-African coast line of the Messageries Maritimes Company, of Marseilles, France, call regularly at Tamatave about the 6th or 7th of each month, en route from France to Mauritius, via Nossi-Bi, Diego Laurez, and Sainte Marie. At Nossi Bi they connect with the auxiliary steamer, *Mpaujaka*, from and for Nossy Vey, Morondava, Mainterano, and Majonga. Also, about the 26th of each month, the steamer of the second month preceding returns, en route for Marseilles, via the same ports, and making connections with the *Mpaujaka* at Nossi-Bi for the same ports on the west coast of Madagascar, thus giving both the east and west coasts a semimonthly service for mails, passengers, and freight. Another auxiliary steamer, plying between Mauritius, Reunion, and Mahe, makes connection at the latter place with outward and homeward mail steamers on the Australian and New Caledonian line of the

same company in such a manner as to enable a transfer of mail and passengers to and from Madagascar and intermediate points.

The following tables, A, B, C, and D, give all needed information as to distances and freight and passenger rates, and may be considered reliable.[1]

TABLE A.—*Distances on Oriental-African coast line (Messageries Maritimes Company).*

[In miles of 1,852 French meters; 1 = 1.15 English miles.]

From—	To—											
	Port Said.	Suez.	Obock.	Aden.	Zanzibar.	Mayotte.	Nossi Bi.	Diego Suarez.	Sainte Marie.	Tamatave.	Reunion.	Mauritius.
Marseilles	1,503	1,590	2,850	2,970	4,745	5,305	5,480	5,653	5,993	6,077	6,448	6,568
Port Said	------	87	1,347	1,467	3,242	3,802	3,977	4,150	4,490	4,574	4,945	5,065
Suez	------	------	1,260	1,380	3,155	3,715	3,890	4,063	4,403	4,487	4,858	4,978
Obock	------	------	------	120	1,895	2,455	2,630	2,803	3,143	3,227	3,598	3,718
Aden	------	------	------	------	1,775	2,335	2,510	2,683	3,023	3,107	3,478	3,598
Zanzibar	------	------	------	------	------	560	735	908	1,248	1,332	1,703	1,823
Mayotte	------	------	------	------	------	------	175	348	688	772	1,143	1,263
Nossi Bi	------	------	------	------	------	------	------	173	513	597	968	1,088
Diego Saurez	------	------	------	------	------	------	------	------	340	424	795	915
Sainte Marie	------	------	------	------	------	------	------	------	------	84	453	575
Tamatave	------	------	------	------	------	------	------	------	------	------	371	491
Reunion	------	------	------	------	------	------	------	------	------	------	------	135

[1] During the present Franco-Malagasy war, the Tamatave service has been slightly changed. The outward mail goes from Mayotte to Majonga, Nossi Bé, Diego Saurez, Tamatave, Reunion, and Mauritius, reaching Tamatave the 8th or 9th of each month. These boats do not call at Aden; and the Mahe-Reunion-Mauritius auxiliary has been abandoned, while a new auxiliary, *The Amazone*, plies on a special service, on arrival of the mail from France, from Majonga to Mahe (via Nossi Bé, Diego Saurez, and Reunion), where it connects with the Australian mail from Europe. This gives the east coast below Diego Saurez but one mail a month instead of two, as formerly.

TABLE B.—*Showing passenger rates to and from Marseilles, Messageries Maritime line.*

From—	To— Port Said.	Suez.	Obock.	Aden.	Zanzibar.	Mayotte.	Nossi Bi.	Diego Suarez.	Sainte Marie.	Tamatave.	Reunion.	Mauritius.
Marseilles:												
First class	$80	$90	$170	$175	$220	$228	$236	$240	$245	$245	$250	$250
Second class	60	68	113	116	160	166	172	175	180	183	190	190
Third class	30	34	62	64	80	83	86	88	90	92	95	95
Port Said:												
First class	.....	12	110	110	160	190	205	210	216	216	240	240
Second class	.....	9	85	85	135	140	147	150	155	158	165	165
Third class	.....	6	42	42	68	70	74	75	78	79	83	83
Suez:												
First class	.....	.....	100	100	150	180	195	200	206	206	230	230
Second class	.....	.....	77	77	127	132	140	142	147	150	157	157
Third class	.....	.....	38	38	64	66	70	71	74	75	79	79
Obock:												
First class	.....	.....	.....	10	100	120	140	150	160	165	180	180
Second class	.....	.....	.....	7	70	90	105	112	140	124	135	135
Third class	.....	.....	.....	4	35	45	52	56	60	62	68	68
Aden:												
First class	.....	.....	.....	.....	100	120	110	150	160	165	180	180
Second class	.....	.....	.....	.....	70	90	105	112	140	124	135	135
Third class	.....	.....	.....	.....	35	45	52	56	60	62	68	68
Zanzibar:												
First class	.....	.....	.....	.....	.....	60	75	90	110	116	140	150
Second class	.....	.....	.....	.....	.....	45	56	67	82	87	105	111
Third class	.....	.....	.....	.....	.....	23	28	34	41	44	53	56
Mayotte:												
First class	.....	.....	.....	.....	.....	.....	14	28	46	50	72	80
Second class	.....	.....	.....	.....	.....	.....	11	22	34	38	54	60
Third class	.....	.....	.....	.....	.....	.....	6	11	17	19	27	30
Nossi Bi:												
First class	.....	.....	.....	.....	.....	.....	.....	14	34	40	64	72
Second class	.....	.....	.....	.....	.....	.....	.....	11	25	30	48	54
Third class	.....	.....	.....	.....	.....	.....	.....	6	13	15	24	27
Diego Suarez:												
First class	.....	.....	.....	.....	.....	.....	.....	.....	20	28	52	60
Second class	.....	.....	.....	.....	.....	.....	.....	.....	15	21	38	45
Third class	.....	.....	.....	.....	.....	.....	.....	.....	8	11	19	23
Sainte Marie:												
First class	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	30	38
Second class	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	23	29
Third class	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	11	14
Tamatave:												
First class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24	32
Second class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	24
Third class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	12
Reunion:												
First class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13
Second class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
Third class	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5

NOTE.—Deck passage is sold between points at about one-quarter first-class fare. First and second class railway tickets are sold passengers of such grades on board prior to arrival at Port Said for $25 and $20 to London, England. $1 = 96½ cents United States gold.

TABLE C.—*Showing freight rates per 1,000 kilograms on same line.*

From—	To— Marseilles.	London.	New York or Boston.
Tamatave	$12.00 to $16.62½	$13.00 to $17.50	$21.40 to $29.22½

NOTE.—Freight rates between local points are variable. These steamers, because of their Government subsidy and passenger traffic, do not seek for local freights, but only through freights. Agents here claim inability to quote freight rates from other points than Tamatave.

TABLE D.—*Names and size of vessels on same line.*

Name.	Tonnage.	Horse power.	Name.	Tonnage.	Horse power.
Sindh	3,373	2,900	Traonady	3,785	2,900
Ava.	3,361	2,400	Djemnah	3,785	2,900
Amazone	3,350	2,400	Mpaujaka *a*	684	450
Pei Ho.	3,392	2,400			

a This vessel plies down the west coast of Madagascar only. Has first-class and deck accommodations for passengers only.

Rates of passage between ports on west coast of Madagascar.

From—	To—			
	Majonga.	Mainterano.	Morondava.	Nossy Vey.
Nossi Bé:				
First class	$20	$40	$50	$70
Deck	5	10	13	17
Majonga:				
First class	.....	20	32	50
Deck	.....	5	8	13
Mainterano:				
First class	.....	.....	12	30
Deck	.....	.....	3	8
Marondava:				
First class	.....	.....	.....	20
Deck	.....	.....	.....	5

The Messageries Maritimes is the great commercial maritime company of France, and is, I understand, heavily subsidized by the French Government. In truth, one is always surprised on boarding the steamers of this company at their small cargo capacity compared with their size. It is claimed, however, that under their subsidy a certain proportion of their lower hold must be used for storage of munitions and material wherewith to transfer the harmless merchant steamer into an effectively armed one in case of war. It is further claimed that this is not only the case upon this branch, but upon all its branches.

The condition of this particular branch, the Oriental African Coast line, is good, although lately considerable complaint is heard, both as to the equipment and the service, the claim being made that the company is spending all its money in improving the Australian-New Caledonian line and neglecting this branch.

Austrian Lloyd.—The Austrian Lloyd steamers, plying between the Black Sea and Mozambique and Natal, make monthly calls at Nossi Bé, freights and passenger receipts warranting. Of this line I can secure no details. I hear it has been months since they last put into Nossi Bé.

Havre Peninsular Line.—The freight boats of the Havre Peninsular Line of French steamers make monthly calls at Nossi Bé, Diego Suarez, Sainte Marie, and Tamatave, proceeding from Tamatave to Mauritius, via Reunion, but they never return this way homeward. They are commonly known as the "Ville boats," being all named after cities. It is difficult to secure any information either as to their size or rates on freight and passage (their passenger capacities are usually very limited), owing to the lack of interest the local agents here exhibit.

These, with an erratic fleet of small sailing vessels, owned by merchants here, and a "tramp" ship, or steamer, cover the ocean traffic of this great African island.

In conclusion I would state that this report has lain for months, roughly drafted, upon my desk, awaiting missing information from the Castle and Havre lines' agents. Repeated requests have been made and innumerable promises given that it would be immediately forthcoming, but as yet without result.

In the interim an American line of steamers, chartered by New York brokerage firms, has begun to make regular trips to this country, via Cape Town and South African ports, but as yet it can scarcely be considered a regular line.

EDW. TELFAIR WETTER,
Acting Consul.

TAMATAVE, *April 15, 1895.*

MAURITIUS.[1]

RAILWAYS.

The Colonial Government of Mauritius owns and controls the various railway lines of the island, which are under the management of a general superintendent. The system consists of two main lines—the North and the Midland—having a common terminus in Port Louis and three branch lines connecting with the main lines at intermediate stations.

The Moka branch, 16 miles in length, begins at Rose Hill station, on the Midland line, and runs through the districts of Plaines Wilhems, Moka, and Flacq, to Montagne Blanche. The running gradient on this line is 1 in 40. The two principal bridges on this branch are built of masonry, viz, the bridge over the River Plaines Wilhems, with two semicircular arches of 50 feet span, and a height of 30 feet above the river bed; and the Reduit viaduct, over the River Cascade, with three arches, the central one of 70 feet span, with a rise of 27 feet, and the two side ones semicircular, of 50 feet span. The rail level on this viaduct is 80 feet above the bed of the river.

The Savanne branch, 11 miles long, begins also on the Midland line, at Rose Belle station, and runs through the district of Grand Port and Savanne, to Souillac. The ruling gradient is 1 in 40. The principal bridge is the viaduct over the River des Anguilles, of three spans, two of 70 feet and a central one of 85 feet, with iron girders, supported on masonry piers. The rail level on this viaduct is 105 feet above the bed of the river.

---

[1]Consul Campbell states that the delay in forwarding his report was due to the nonreceipt of the Department's first instructions on the subject.

The total length of the Midland line is about 36 miles. It traverses the center of the island, running through the districts of Port Louis, Plaines Wilhems, and Grand Port, to Mahebourg. The highest level above the sea, 1,828 feet, is attained between the stations of Curepipe and Forest Side. The gradients on this line are unusually great, 1 in 27 occurring repeatedly.

The principal bridges (wrought-iron girders) are the bridges over the River St. Louis, with one span of 90 feet and a height of 25 feet; the viaduct over Grande River, in five spans of 126 feet each, supported on cast-iron columns filled with concrete, and having a height of 140 feet above the bed of the river. There is also the viaduct over the River La Choux, of three spans, two of 75 feet and one of 58 feet. A line to the district of Black River is in contemplation.

The North line, about 31 miles in length, runs through the districts of Port Louis, Pamplemousses, Riviere du Rempart, and Flacq to Grand River. It was the first open to traffic in May, 1864. The principal bridge on this line is an iron viaduct over the "Iron Fanfaron," composed of 16 spans of 36 feet each, supported on cast-iron screw piles filled with concrete, and built on a curve of 2,000 feet radius. The maximum gradient on this line is 1 in 80, and the highest point attained is 329 feet above the level of the sea. The tracks are generally single, and are what are called in the United States broad gauge.

Tariffs.—On the Midland line, from one terminus to the other, that is, from Port Louis to Mahebourg (36 miles) first-class passengers pay 4.32 rupees[1] (about $2.16); second class, 2.88 rupees ($1.44); third class, 1.44 rupees (72 cents).

The intermediate tariffs are comparatively a little in excess of the through tickets. For example, Curepipe is considered halfway between Port Louis and Mahebourg, and the first-class fare to that point is 192 cents; second class, 128 cents, and third class, 64 cents of the rupee. Shorter distances are charged for proportionally.

Tariffs on the North line from Port Louis to Grand River (31 miles) are: For first class, 3.72 rupees; second class, 2.48 rupees; third class, 1.44 rupees.

Contract tickets are issued on these lines good for one month, three months, six months, and one year at considerably reduced rates. The communication between intermediate stations from Port Louis to Curepipe is frequent. During the early morning and from 3 p. m. to 6 p. m. trains are run frequently, owing to the fact that all the Government employees and everyone else who can afford it reside in the mountainous parts of the island in order to escape the fevers of this unhealthful town. There is only one through train daily on each line.

Freight rates for parcels, from any station irrespective of distance, are as follows: Not exceeding 15 kilograms (31.07 pounds), 0.25 rupee; not

---

[1] It will be seen that the consul estimates the rupee at 50 cents in his reductions.

exceeding 50 kilograms (110.23 pounds), 0.50 rupee; not exceeding 75 kilograms (165.34 pounds), 0.75 rupee; not exceeding 100 kilograms (220.046 pounds) 1 rupee.

Merchandise is classed under five heads—first, second, third, fourth, and fifth. Under the head of first the rate from Port Louis to Mohebourg is 3.82 rupees; second, 5.89 rupees; third, 7.69 rupees; fourth, 9.39 rupees; fifth, 10.21 rupees. Special rates are given for sugar and provisions. The term provisions, for which special rates are made to some stations, is to include all articles, except machinery, furniture, and dangerous goods, carried from Port Louis to the estates of planters whose sugar is brought to Port Louis by railway, provided they are sent in lots of not less than 3 tons, otherwise they will be chargeable according to this classification; provisions for storekeepers and others not sending sugar may also be carried at special rates when sent in full wagonloads of 3 tons and upward, but in this latter case the term is only to include grain, salt fish, salt, rum, vin ordinaire, and oil—small quantities being chargeable according to classification.

The railway debts stood as follows on December 31, 1885:

Name of railway and character of indebtedness.	Pounds sterling.	Equivalent in United States money.
Mauritius Railway debentures, payable February 15 of this year (1895), and January 15, 1896	240,000	$1,167,840
Savanne Railway, 4½ per cent, payable by annual drawings in and from 1881 to January, 1896	95,800	466,163
Moka Railway, 4½ per cent, payable by annual drawings in and from 1884 to 1896	104,000	506,064
Consolidated, 4 per cent, payable by annual drawings from 1882 to 1896	302,800	1,473,425
Total	742,600	3,613,492

OCEAN LINES.

The harbor of Port Louis is considered one of the safest and best in these latitudes. It can accommodate about 200 vessels of a tonnage ranging from 100 to 6,000 and upward. The port has three dry docks of 318, 320, and 377 feet capacity. The patent slip can only receive vessels of about 300 tons register.

Steamers of the Messageries Maritimes Line communicate with this port twice a month. They run from Marseilles to Mahe (Seychelles), taking passengers and mail. Other steamers of the line, homeward and outward bound, for Europe and Australasia, call to take passengers and mail to and from this island. Another steamer of this line leaves on the 23d of each month for Reunion, Madagascar ports, and Zanzibar, and through the Suez Canal for Marseilles.

The British India Steam Navigation Company, Limited, has a steamer touch here, at somewhat irregular dates, which takes passengers, etc., to Australia and Europe, via Colombo.

The Castle Line Packet Company dispatch a steamer once a month for Natal, Cape Town, and England. These boats carry freight chiefly, but passengers are also booked.

HIGHWAYS.

The width of the highways in the country districts of Mauritius ranges from 20 to 25 feet, while those in Port Louis vary from 12 to 20 feet.

JOHN P. CAMPBELL,
Consul.

PORT LOUIS, *April 18, 1895.*

MOZAMBIQUE.

OCEAN LINES.

The principal highway of commerce of this province is the Indian Ocean, or rather, that part of it known as the Mozambique Channel.

German East African Line.—The ocean line enjoying the greatest amount of traffic in these waters at present is the Deutchen Ost Afrika Linie (German East Africa Line), owned and operated by the company bearing the same name. The steamers of this line sail from Hamburg every four weeks and call at Amsterdam, Lisbon, Naples, Port Said, Suez, Aden, Tanga, Dar es Salaam, Zanzibar, Beira, Lorenzo Marquez, and Durban, the last-named port being the terminus of the line. A coasting steamer of this line sails between Mozambique, Parapat (Antonio Ennis), Kiliman, Chinde, Beira, and Inhambane. The total length of the voyage from Hamburg to Mozambique is 8,040 nautical miles. The coast distances from Mozambique are as follows:

To—	Miles.	To—	Miles.
Parapat	95	Inhambane	790
Kiliman	315	Lorenzo Marquez	940
Chinde	385	Durban	1,260
Beira	485		

The company's fleet consists of three single-screw steamers of 3,000 tons each, able to steam about 12 knots; two of 2,600 tons each, steaming about 10 knots; one of 1,150 tons, one of 1,400 tons, and two of 600 tons each. The last four are rather slow boats and are employed in the coasting and India trade. The three largest vessels carry on the regular service from Hamburg, as do also the two next in size, but the latter are also going to run alternately occasional trips via the West Coast and the Cape of Good Hope.

The accommodations for passengers on these steamers are excellent, but the food provided is a little too heavy and rich for a tropical climate.

First-class passenger fare is as follows:

From—	To—	Fare.	From—	To—	Fare.
Hamburg	Mozambique	$200	Mozambique	Lorenzo Marquez	$44
Do	Beira	212	Do	Durban	72
Do	Lorenzo Marquez and Durban.	225	Beira	Lorenzo Marquez and Durban	40
Mozambique	Beira	37			

The charge for first-class freight from Hamburg to Mozambique and other coast ports is $10 per ton. The charge on the same freight from Hamburg to Delagoa Bay (Lorenzo Marquez) and Durban is but $7.50 per ton. The freight charges on produce from the east coast to Naples, Lisbon, Rotterdam, Marseilles, Bremen, and Hamburg are from $10 to $20 per ton.

Union Steamship Company.—The steamers owned and operated by the Union Steamship Company, Limited, of London, are the largest doing business on this coast. A steamer sails from London, via Lisbon, Madeira, and Cape of Good Hope ports, to the various ports of this province every four weeks, and is under a contract with the Portuguese Government to carry the Portuguese mails. These steamers go as far north as Zanzibar, where they connect with vessels of the British India Company, afterwards returning by the same route, a voyage of nearly 20,000 nautical miles, as shown by the following table:

From—	To—	Miles.	From—	To—	Miles.
London	Lisbon	1,000	Lisbon	Beira	6,768
Lisbon	Madeira	515	Do	Kiliman	6,935
Do	Cape Town	5,188	Do	Mozambique	7,235
Do	Lorenzo Marquez	6,300	Do	Zanzibar	7,805
Do	Inhambane	6,530			

This company has an extensive fleet, but only the following vessels are employed in this trade, viz:

Name.	Propulsion.	Tons.	Horse-power.
Gaul	Twin screw	4,744	2,000
Greek	do	4,338	2,000
Goth	do	4,820	2,000
Trojan	Singlescrew	3,741	4,100
Spartan	do	3,403	4,100
Pretoria	do	3,198	3,650
Arab	do	3,192	3,600
German	do	3,007	2,650
Anglian	do	2,158	1,700
Saxon	do	462	500
Two tenders		100	200–300

These vessels, with the possible exception of the *Saxon*, are first class in every respect. On board of them the traveler will find every comfort and many luxuries. Iron berths, with woven wire mattresses, and patent lavatories, are in many of the cabins and staterooms, and nearly all are lighted throughout by electricity.

In many of these steamers the second-class accommodation is practically equal to the first class of many of the Atlantic liners, the cabins being large, light, and well-fitted, and the meals and attendance good.

First-class passenger fares from Mozambique are as follows:

To—	Fare.	To—	Fare.
Zanzibar	$34.00	Lorenzo Marquez	$53.50
Kiliman	19.50	Durban	63.00
Chinde and Beira	34.00	Cape Town	106.00
Inhambane	44.00	London	225.00

By agreement with the Portuguese Government a special rate is given to Lisbon.

First-class freights per ton, including landing charges, from Mozambique are as follows:

To—	Rate.	To—	Rate.
Kiliman and Chinde	$8.40	Durban	$10.80
Beira	9.75	Cape Town	*a* 12.00
Inhambane	10.20	London	*a* 21.40
Lorenzo Marquez	11.40		

a For produce.

The agent in Mozambique for this line has no quotations of first-class freight charges to the two last-named ports.

Castle Line.—A steamer of a little over 1,000 tons, belonging to the Castle Steamship Line, owned and operated by Donald Currie & Co., London, sails from Durban with passengers and cargo every two weeks for Lorenzo Marquez, Inhambane, and Beira.

Other lines.—Four other steamship lines, carrying both passengers and freight, send steamers from English ports to this coast, via the Cape, at irregular intervals.

Clan Line.—The Clan Line, of Liverpool, which devotes its vessels almost exclusively to freight traffic, has a number of steamers engaged in the trade between New York and south Africa. These steamers sail from New York monthly, as a general rule, and call at Lorenzo Marquez and, when they have sufficient freight, at the other ports in this province also. After discharging their cargo here, they do not return to New York, but go east and generally load in India for some English port.

RAILWAYS.

Delagoa Bay Railway.—This road (Caminho de Ferro Portuguez de Lourenço Marques ao Transvaal), owned and operated by the Portuguese Government, is a narrow-gauge line (3 feet 6 inches), 56 miles in length, running between Lorenzo Marquez and Ressano Garcia, on the Transvaal frontier, beyond which it is continued by the line of the Netherlands Railway Company, which line is now nearly completed to Pretoria, the capital, and Johannesburg, the great mining town of the South African Republic. The line (single track) is in fairly good condition, but better accommodations for freight, more sheds in the Lorenzo Marquez yard, and more rolling stock are needed. The rolling stock at present consists of 11 locomotives, 16 passenger cars, and 161 freight and ballast cars, and all could be improved upon. The freight rates between terminals average about $3.50 per ton, and passenger rates, first class, about 3½ cents per mile.

When the Transvaal extension of this line is completed, which will be about the end of the year, low through rates for both passengers

and freight will be quoted from Lorenzo Marquez to Johannesburg and Pretoria.

The history of this line dates from December 14, 1883, when Col. Edward McMurdo, an American engineer, secured a concession from the Portuguese Government for the construction of the railway. An English syndicate afterwards took over the concession and had almost finished the line when the time for completion under the concession expired. Subsequently, on the 25th of June, 1889, a decree was signed in Lisbon canceling the concession and declaring the line forfeited to the Portuguese Government, failure of contract being the reason given for such proceedings, and on the 29th of the same month the Portuguese authorities in Lorenzo Marquez took forcible possession of the line, completed it later on, and have held and operated it ever since. No doubt the malignant form of fever that was prevalent in the districts traversed by this line was one of the principal causes for the delays in its construction, as it was impossible to keep a full force of men at work. Thousands, black and white, died while the work was being carried on, and were buried almost where they fell. The total number of deaths among the employees during the construction of this line will probably never be known. Had the contractors published the number of deaths it is probable that they would have been unable to obtain men.

The Beira Railway.—This road is not yet out of the hands of the contractors, who, when the line is finished, will turn it over to the Beira Railway Company. This railway is being built with the object of connecting Beira on the coast with Manicaland and Mashonaland, countries that are reported to be rich in gold. It starts from Fontesvilla, 45 miles from Beira, up the Pungwe River, and at present is open for traffic for a distance of 75 miles, and work on the next extension, 44 miles in length, to a place called Chimoio, is now progressing at a fair rate. The line at present is being constructed on a 2-foot gauge, with the intention of widening it to 3.6 feet later on, and the equipment and rolling stock are neither extensive nor elegant, simply serviceable. The roadbed for many miles from Fontesvilla is nothing more nor less than black mud covered with a little ballast, and during the last rainy season many miles of track were under water. Now the work of raising the level of the roadbed by the addition of more ballast of earth and stone is progressing at a favorable rate. Derailments occasionally occur on the line, but as the trains run at a low speed, and the cars are all open, no one is hurt. The contractor takes passengers and freight from Fontesvilla twice a week on an average.

The service from Beira to Fontesvilla is performed by the Beira Landing and Shipping Company, who run light-draft river steamers between the two towns several times a week. Passenger fares on these steamers are $1.25 for the trip; freight, $5 per ton. The fare on the railroad from Fontesvilla to the present terminus is but a few dollars.

Almost all passengers by these lines are bound for the gold fields, and their steamer and car fares are but small items in their expenses for the trip. It is possible to travel from Beira to Salisbury for $50, but it can be done with more comfort for $75 or $100.

Through freight rates from Beira to Salisbury, via river, railroad, and ox wagon or porters, are now quoted at from $75 to $90 per ton, but as the railroad is extended the rates will drop.

RIVER NAVIGATION.

On the Zambesi River and its tributaries several firms and individuals run light-draft steamers, carrying both passengers and freight. These boats are fairly comfortable, but the traveler who intends going up the Zambesi must be prepared not only to suffer physical discomforts but run the risk of contracting the fevers which often affect Europeans coming to this section.

Passenger fares by these steamers from Chinde to the Shire River are from $75 to $100. The traveler who intends going to Lakes Nyassa or Tanganyika must be prepared to pay from $250 to $400 for his traveling expenses. Freights by these steamers vary and are more a matter of arrangement than anything else. Many of the leading corporations in the river and lake districts have their own steamers and lighters for the transportation of their goods. The average charge for 1 ton of freight from Chinde to the border of British central Africa on the Shire River is $100, beyond which point it rises rapidly and 1 ton of freight can not be sent from Chinde to Lake Tanganyika for less than $300.

As these districts are opened up and trade increases, freight rates must gradually decrease and finally reach a reasonable figure.

W. STANLEY HOLLIS,
Consul.

MOZAMBIQUE, *January 1, 1894.*

THE PORT OF BEIRA.[1]

The transit trade of Beira has increased in consequence of the opening of 75 miles of railway from Fontesvilla inland. As there exists a very bad fly patch just beyond 75-mile camp there has not been such an increase in transit trade as might have been expected. The uncertainty which existed at the beginning of 1894 about the railway extension, and the irregularity of native and ox-wagon transport, made merchants very chary of importing through Beira large quantities of goods.

There is no doubt that the district could produce a great deal more than it has done. The rivers which intersect it afford a cheap means

[1] Extracts from the annual report of the British consul at Beira, October 7, 1894.

of transport to the place of export. The native population is very sparse, and, further, the natives are said to be very lazy, and are not yet accustomed to the security from pillage guaranteed to them by Government. They prefer to remain poor, to becoming, in consequence of possessing some property, the objects of envy to stronger neighbors.

The experience of the past two and one-half years has gone to confirm what is the general opinion of the trade of Beira, and that is that it will consist of the forwarding of goods to the Manica gold fields and Mashonaland. During 1892 goods were ordered in the hope of the local trade growing. This hope has not been realized during 1893 and 1894, and merchants are now averse to importing large stocks.

There are no new branches of trade. Under the present fiscal system, and until the completion of the railway to Chimoio, there will be no development of forwarding (the principal business). There are already more storekeepers in the town of Beira than the trade warrants.

All possible facilities are given by the Mozambique Company after licenses and taxes have been paid. Most reasonable allowances are made for delays in passing transit goods through the frontier station. Persons transporting transit goods across the company's territory, if obliged to make use of them within that territory, are allowed to pay duty on such goods at Massikessi in place of being taken up for doing contraband. Goods intended for British territory are passed in transit, a bond with security being given by the owner, who obligates himself to pass all the goods at the frontier fiscal station at Massikessi within three months from the date of clearing at Beira. Goods in transit may be stored in the custom-house stores for 1 shilling per ton per month, or in private bonded warehouses. When owners of transit cargo so wish, they are not required to land it in Beira. They may clear on invoices, and have goods taken up country direct from the ship's side. The principal custom-house is that of Beira, but goods may also be cleared at Senna, on the Zambesi, or at the port of Chiloane, a little south of Beira. During 1893 the imports and exports through Senna amounted to £7,200; through Chiloane to £3,100.

During 1893–94 the Union Steamship Company's steamers called twice a month on the way to and from Zanzibar; the Castle Line Packet Company maintained a fortnightly service with Durban; the German East Africa Company's vessels touched at Beira twice a month on the way to and from Durban; J. Y. Rennie & Son's steamers called about once every three weeks, and steamers of the British Colonial Steam Navigation Company, and of Bullard King called occasionally. The steamer service is more than sufficient for the trade of the place.

The entrance to the harbor is well buoyed and the buoys are well looked after, so that complete reliance may be put in them by vessels entering for the first time. Nothing of importance has been done toward lighting the entrance. Each of the towers on Points Jea and Chiveve bears a light, but these are not visible at any great distance. A new

chart of the entrance channel was published early in 1894, giving the latest soundings. The least water on the bar has been 11 feet at low water, spring tide, the most, 29 feet at high water, spring tides. The vessel of the deepest draft entering the port has been H. M. S. *Magicienne*, drawing probably 23 feet. There is a good anchorage, with a minimum depth of 5 fathoms.

The present dues are slightly altered from those in force in 1893. The old dues were as follows: For steamers, 4½d. per ton of cargo landed or loaded, 1s. 2½d. per passenger or head of cattle landed or loaded. For sailing vessels, 7½d. per ton of cargo landed or loaded, and for both a clearance fee of about 38s., besides cost of guards on board at 1s. 7d. each per day. In August, 1894, it was decreed that on account of the improvements made in connection with the port (1) dues of 4½d. per ton should be paid on every ton of cargo landed or loaded, not only up to 100 tons; (2) the same amount to be paid on every ton of cargo transshipped in the port, and (3) every vessel coming from other ports should pay the sum of £5.

In June, 1884, the Mozambique Company built a substantial wooden landing stage, connected with the custom-house. It measures 293 feet in length by 82 feet in breadth. There is one 30-hundredweight crane on it, and two larger ones are shortly to be put into position. Rails run from the crane into the custom-house stores. As the staging does not project into deep water, goods have to be taken to and brought from vessels in lighters.

For the use of the staging and crane the Mozambique Company makes the following charges:

Class.	Charges.	Class.	Charges.
	s. d.		*s. d.*
Goods weighing over 10 hundredweight, per ton	1 7	Baggage, per package	0 2
Goods weighing under 10 hundredweight, per ton	0 9½	Cattle, horses, and donkeys, each	0 9½
		Goats, pigs, and sheep, each	0 4½

The landing plant of the port includes 15 lighters, with a total capacity of 350 tons; 2 steam tugs, and 3 steam launches. Sixty-one sailing launches hold licenses from the Mozambique Company to carry goods and passengers to and from the various ports of the company's territory. The lighters and steam launches above referred to are used to carry cargo and passengers between Beira and Fontesvilla. With the present plant, the landing company can contract to land at Fontesvilla 100 tons per day, taking the cargo from a vessel in Beira. A steam tug leaves Beira for Fontesvilla several times a week, and usually on the arrival of passengers by any ocean steamer.

The journey to Fontesvilla by steamer occupies about four hours, and the rates are from 15s. to £1 5s. for each passenger, and 15s. to £1 per ton of cargo. The sailing launches maintain communication

between Beira, the Busi River, Chiloane, Sofala, and the Sabi River, as well as going up and down the Pangwe. The landing company can load or discharge 250 tons every twenty-fourhours. At Fontesvilla a steam crane is used to discharge lighters. Landing charges are 10 shillings per ton.

There is practically no freight going homeward. The rates of outward freight depend very much upon arrangement, and vary according to circumstances.

It is intended to place on the Point Jea tower a light visible 12 or 14 miles away, to enable vessels to pick up the port at night. The present light on that tower is of little use, while that on the Chiveve tower only serves to show the anchorage to boats coming in at night.

In 1893, a railway of narrow gauge was laid from Fontesvilla for a distance of 75 miles, and during the present year this line is being extended to Chimoio, a distance of 42 miles. This will bridge the fly belt, and there should then be no difficulty in conveying goods and machinery to Mashonaland and the Manica gold fields. This line has at present a capacity of 60 tons per day. If trade increased, by an augmentation of rolling stock the maximum capacity of the line could be increased to 300 tons per day. The line is therefore more than sufficient for all demands that are likely to be made on it for some years to come.

There are no roads, canals, or bridges of importance in the district. A telegraph line accompanies the railway from Fontesvilla onward. Unfortunately there is no connection with Beira, so that the portion of the telegraph line already in position is practically useful only to the railway company. There is no doubt that were the wire carried from Fontesvilla to Beira, and from Fontesvilla to join the British South Africa Company's system, it would be a great boon to trade.

The most important line of communication is that leading toward Mashonaland. The present rates for passengers on this line and the time occupied on the journey are given below:

Stations.	Time.	Passengers.	Goods per ton.
		£ s. d.	£ s. d.
Beira to Fontesvilla by steamer	Four hours	1 5 0	1 0 0
Fontesvilla to 75 miles	Ten hours	2 0 0	3 15 0
75 miles to Chimoio	Two days on foot, or by wagon, three days.	.....	12 10 0
Chimoio to Salisbury	Passengers, four days; goods, two to three weeks.	9 0 0	15 0 0

SOMALI COAST (BRITISH.)[1]

The Somali Coast Protectorate extends from Lahadu (or Lewadu), which is halfway between Jibuti and Zaila, to the forty-ninth parallel of east longitude. Treaties have been concluded with all the coast tribes, and also with the Gadabursi tribe, which formerly extended to the seacoast. The whole of the protectorate is inhabited by various Somali tribes, split up into numerous subtribes and clans.

The whole of the carrying work of the country is by camels, supplemented, to a small degree, by stout donkeys. Porters are unknown. Trade caravans, that is, not those of persons simply going to their encampments, are escorted by armed attendants supplied by the political agency.

Transit dues are levied by some tribes, and give rise to disputes and troubles. It is to be hoped that they may be abolished before long.

On the coast the currency is the Indian rupee and small silver coinage. In the interior much is done by barter. At Harrar the rupee is not current; the Maria Theresa dollar is in favor there, but small Indian coins (2-anna and 4-anna pieces—especially the former) have at times been in great demand.

At the ports of Zaila, Bulhar, and Berbera British officers are stationed to administer the law, civil and criminal, and collect the customs dues. There is practically no interference with the people outside the ports as long as trade caravans are unmolested; but the officers frequently act as mediators and thus keep the peace. There are also "kazis," or native judges, who perform marriages and such rites, and decide religious matters. As the people are altogether Mohammedans, the social customs are governed by the tenets of this religion in a great measure, and thus the "kazis's" jurisdiction is essential. Disputes are often referred to "punchayets," or arbitrators. Most of the tribes with which the agency has to deal have "akils," or wise men, who receive small stipends from the Government. They act as go-betweens with their several tribes, and as the tribes' agents and representatives with the Government officials.

The ports of the protectorate are known as customs ports and flag ports. The former are Zaila, Bulhar, Berbera, and Karam; the latter are Ainterad, Ankor, Raguda, Shellao, Hais, Mait, and Haschow. At the customs ports (except Karam), British officers are stationed and customs duties are levied; these, in fact, forming almost the entire revenue of the ports. Karam's revenue is so small that it can not support an establishment, and the duties are levied at Aden on exports from and imports to that port. Berbera is the only real harbor within the protectorate, and is the chief center of trade. It is necessary to mention

[1] Extracts from report of Lieutenant-Colonel Stace to British foreign office for the year 1891–92.

Aden [Arabia], because Somaliland is dependent on this place in the matter of trade, in the same way that Aden is to a very great extent dependent on Somaliland for its meat supply. Aden was famous, it is said, in the olden days as an emporium. The trade has developed since its occupation by the British in 1839, until last year the value of the trade reached over £7,000,000 (£1=10 rupees), excluding Government treasure and stores and all goods manifested for direct transshipment though landed. Aden produces nothing. The consumption of merchandise is, of course, comparatively small, with a population of only about 40,000 people, the majority very poor; but it is the great distributing center for the Gulf of Aden, including the south Arabian ports, in a great measure for the east coast of Africa, and for various ports of the Red Sea. The produce of the Somali Protectorate must come to Aden, and, on the other hand, all the requirements of the Somali Coast are distributed from Aden, which is a free port, so far as customs duties are concerned. Careful statistics of the Somali Coast trade are kept in Aden, and also on the Somali Coast, the revenue from the customs ports being that from which the expenses of administration are derived.

The transport of goods and merchandise is carried on by means of small local steamers, and also by means of native craft called baggalas or dhows. There are at present two steamers running to and from the Somali Coast, one belonging to Cowasju, Dinshaw & Bros., an old firm well known in Aden and elsewhere. This firm has now the postal contract for the Somali Coast, with a subsidy from the Government of 600 rupees per month, and is bound to run a steamer once a week. The other, less regular, belongs to the Perim Coal Company. They are now running in competition. Native craft are numerous, but decreasing somewhat since the regular running of the steamers during the last three years. During the fine season—the cold weather—the baggalas are constantly running to and fro, but during the monsoon months few venture to cross the gulf.

ROAD IMPROVEMENT.[1]

At the close of the official year, or soon after, trade at Jibuti was practically at a standstill. The Franco-African Company had been improving the road, and laid down rails to facilitate the carriage of material as far as Hyabili, about 5 miles from Jibuti. But the Dunkalis and Black Esa were opposed to any scheme of wagon traffic between Jibuti and Harrar, fearing that the employment of their camels would cease, so the road work was stopped, but the rails laid to Hyabili remain in statu quo. The idea appears to be to connect Jibuti with Abyssinia by a road adapted to wagons drawn by bullocks.

---

[1] Extract from annual report of British agent at Aden, August 20, 1894.

ZANZIBAR.[1]

Exporters from Zanzibar labor under a great disadvantage in the irregularity of communication with Europe. With the exception of an occasional private steamer, which, moreover, is not always in a position to accept extraneous cargo, there are only the three ordinary mail lines by which shipments can be made, the Portuguese mail service to East Africa having now been discontinued for a considerable period. Of these three lines the Messageries Maritimes runs monthly, leaving Zanzibar on the 3d or 4th day of each month, while the boats of the German East Africa and of the British India Steamship companies leave at regular intervals of four weeks, and always within a day or two of each other. It not infrequently happens, therefore, that all these ships leave Zanzibar at approximately the same time, while for the rest of the month there is no communication with Europe whatever, and shippers have been known to prefer sending their goods by the much longer route via the Cape rather than wait weeks for a steamer proceeding directly homeward, with an additional uncertainty as to whether the vessel, if it is one which has called at southern ports on her way to Zanzibar, will not already have taken all the cargo which she is able to carry; and, in the case of the British India Company's steamers, with the added risks of transshipment and delay at Aden. It would be an incalculable boon to the trade of Zanzibar if some arrangement could be effected between the various lines of steamers so that their departure from this port might occur at different and at more or less regular intervals.

Hopes were at one time entertained that a tramway or a narrow-gauge railway line would be laid down through the most cultivated districts, and thus set free for purposes of cultivation many of the domestic classes who are now employed in carrying produce into the town on their heads; but although several firms have opened negotiations on the subject, no definite proposal has yet been submitted for the consideration of the authorities.

There is a slight diminution of both the number and the tonnage of seagoing vessels that have entered this harbor during the twelve months under review as compared with the preceding year, but this is easily accounted for by the fact of the Portuguese line of mail steamers having ceased running. British shipping is still to the fore so far as numbers are concerned, and falls little short of German vessels in the matter of tonnage. It must not be forgotten, however, that the British lines of mail boats make Zanzibar their terminus, whereas both the French and the German lines proceed to ports farther south, and again call at this port on their return journey.

Under the able management of Captain Agnew, R. N. R., port officer to the Government of His Highness the Sultan, in succession to

[1] Extracts from annual report of the British consul at Zanzibar, March 31, 1894.

Commander Hardinge, R. N., the harbor service has been most efficiently carried on, and has in several ways been improved. The port rules and boat tariff have been revised and the different anchorages clearly defined; the shore boats are all registered and numbered and their crews kept under proper supervision; the beach is kept clean and order maintained by an efficient staff of water police; and a slip has been constructed for hauling up small lighters and steam launches. The registration of native canoes has also been taken in hand, and there are now some 160 of these craft on the registers, all of which are licensed and numbered. A most strict control is maintained over dhows and native vessels, of which there are now 414 belonging to this port, representing a tonnage of 9,164 tons and manned by 2,943 men and boys.

The Zanzibar Government is not in a position to do more than keep the present light-houses, which are provided with lights of a very inferior description, in a moderate state of repair. It is much to be regretted that the opposition of one of the treaty powers prevents a small tax being imposed on all ships entering this harbor, with a view to putting and keeping the light-houses in a thorough and reliable state of efficiency and to effecting other reforms in the service of and the approaches to this harbor.

CAPE COLONY.

OCEAN LINES.

The following lines of ocean travel to this port are all controlled by private companies: The Castle Steamship Company, from London; the Union Steamship Company, from Southampton; the Clan Line Steamship Company, from Glasgow and Liverpool; Bullard, King & Co. Steamship Company, of London, about monthly; Bucknall Bros. Steamship Company, of London, about fortnightly; New Zealand Shipping Company, of London, about fortnightly; Orient Steamship Company, of London, about fortnightly; American and African Steamship Company, from New York, monthly.

Of the above lines, what are commonly known as coast lines, from this port to Port Elizabeth, East London, Durban, and Beira, all on the east coast, the Union Line, the Castle Line, and the American and African Line may be reckoned as the chief.

It would be impossible to answer the question, "What is the length of the total line and the main points touched?" because there are several lines, the main points touched differing with the lines and with special contracts with some of the lines. The Castle and Union lines run from London and Southampton, respectively, as above stated, and touch at Madeira, Teneriffe, and St. Helena en route to Cape Town; thence to

Mossel Bay, Knysna, Port Elizabeth, East London, Durban, Beira, Delagoa Bay, and Mauritius. The distance from London to Cape Town is about 6,000 miles; to Port Elizabeth, about 6,300; to Durban, 7,000, and to Beira, 7,300.

The condition of the Union and Castle lines is excellent, of the American and African Line (being composed of specially chartered ships) varying, but generally good, and of the other lines fair.

There are no river or canal lines in South Africa. The Castle and Union lines have each about fifteen to twenty steamers, ranging from 6,000 tons downward, with horsepower varying from 300 to 10,000. The average speed of boats used for carrying direct mail is 13 to 15 knots per hour. Boats stopping at intermediate points average 12 to 14 knots.

The American and African Company charters steamers direct from New York to this port, arriving here about once a month, distance of 7,000 miles, and freight rates are cheaper than via England by any line.

RAILWAYS.

Generally there is but one track, but on frequently traveled divisions, e. g., Cape Town to Simons Town, there are double tracks most of the way. I give below the distances:

From—	To—	Miles.	From—	To—	Miles.
Cape Town	Kimberley	647	Cape Town	Port Elizabeth	839
Do	Vryburg	774	Port Elizabeth	Kimberley	485
Do	Johannesburg, South African Republic.	1,014	Do	Pretoria	740
			Do	Vryburg	673
			East London	Kimberley	546
Do	Pretoria, South African Republic.	1,040	Do	Vryburg	666
			Do	Pretoria	692

Rates for passengers on Government railways are 1, 2, and 3 pence (or 2, 4, and 6 cents) per mile. Freight, per 100 pounds, according to distance, first, second, and third class rates, having regard to class of goods conveyed, mining, manufacturing and agricultural machinery being conveyed at lowest rate, and furniture, glassware, and breakable goods at the highest rate, about as follows:

To—	First class.	Second class.	Third class.
Johannesburg	$6.08	$4.56	$2.43
Vryburg	4.66	3.15	1.38

These railway lines are in fairly good condition, but, owing to the sandy nature of the soil, as a measure of safety the rate of speed is not above 25 to 30 miles per hour.

HIGHWAYS.

At the different termini of railways, coaches form the chief conveyance for passengers and wagons for freight. In some parts the roads

are very good, being about 30 feet wide; in other parts the veldt is used, according to the state of the acknowledged track, but the coach drivers are not particular whether they keep on the road or not; they choose the best track.

There is daily communication on most of the coach, postal, and freight routes.

It is very difficult to give an accurate report on the management and running of trains and coach and wagon service here. Towns are very widely separated, and as regards wagon transport, it is mainly dependent on the state of the weather and country, as owing to floods in winter the rivers for days are not passable, being crossed chiefly by drifts or fords, and in summer, owing to droughts, forage for cattle is oftentimes very scarce. In consequence, rates vary greatly, being at some periods three or four times as much as at other times, and transport riders are not willing to run the risk of losing their cattle. Of course, with the advance of railways, facilities for transport of goods inward will be greatly increased. I do not know of any particular roads requiring any special mention other than as above. The route via Kimberley and Vryburg and the route via Johannesburg and Pretoria being the two direct lines from the colony to Mashonaland and Matabeleland, coaches connecting with these two railway termini run to Victoria, Tuli, and Salisbury in Mashonaland and Buluwayo in Matabeleland once or twice a week, recognized agents being resident in Cape Town.

C. H. BENEDICT,
Consul.

CAPE TOWN, *June 26, 1894.*

ORANGE FREE STATE.

RAILWAYS.

The particulars regarding the ocean lines touching at the ports of Cape Town, Port Elizabeth, East London, and Durban (Natal) will be found in the reports of the consuls stationed thereat. These ports are connected with the Orange Free State by railways which run into one great through line before entering this State. With the exception of the Natal Free State Railway, which is controlled by the Natal Government, all the other lines in the Free State and south of it are worked by the Cape Colony Railway Government. The terminus of the Natal Free State Railway is Harrismith, but the line will soon be constructed to a point between Kroonstad and Winburg, to join the great through line, in which case it will have a length of 240 miles, reckoned from Durban (Natal) to the junction on the great through line. The terminus of the Orange Free State through line, into which all the port

lines run, is Pretoria. The distances from Pretoria to the different ports are: To Cape Town, 1,040 miles; to Port Elizabeth, 740 miles; to East London, 692 miles.

To find the distance to Bloemfontein from any of the above-given ports, subtract 290 miles from the number of miles given.

In fine weather the railway is in a fair condition, but in the rainy seasons the line is dangerous, especially that part from Norvals Pont to Johannesburg. This is owing to the line being in use only a few years and the track not having thoroughly settled; besides, the ground is of a particularly soft nature, and washes away in case of even mild rains.

We have only single-track railway lines. The communication is daily, and goods trains run to the number of six per day either way (north or south). The first-class passenger fare is 6 cents per mile.

The following schedule of freight rates gives full information upon this phase of the subject:

GOODS RATES TO AND FROM STATIONS WITHIN THE ORANGE FREE STATE.*

Local classification of goods between stations within the Orange Free State.

Grain and agricultural produce are included in the fourth class, otherwise, with the exception of stone fencing posts, which are conveyed in truck loads at 1d. per ton per mile, subject to a minimum charge of 1s. 3d. per ton, station to station, at owner's risk; the ordinary classification is observed.

Local rates between stations within the Orange Free State.

First class, 6d. per ton per mile; minimum charge 5s. per ton. Second class, 4½d. per ton per mile; minimum charge 3s. 4d. per ton. Third class, 2d. per ton per mile; minimum charge 1s. 8d. per ton. Fourth class, 1½d. per ton per mile; minimum charge 1s. 8d. per ton.

Live stock and vehicles are charged at the ordinary mileage scale, according to distance as per tariff applicable to the Cape Colony.

Through rates per 100 pounds between the colonial ports and stations in the Orange Free State, exclusive of cartage

To—	From—										
	Cape Town.					Port Elizabeth.				
	1	2	3	4	Wool, skins, hides.	1	2	3	4	Wool, skins, hides.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Donkerpoort	11 8	10 3	4 7	4 0	4 7	7 7½	6 0	2 5½	2 1¼	2 5½
Priors	11 10	10 3¼	4 7½	4 1	4 7½	7 9	6 3	2 6	2 2	2 6
Springfontein	12 1½	10 3½	4 10	4 2	4 10	8 1	6 5	2 8	2 3	2 8
Jagersfontein Road	12 2	10 4	5 0	4 3	5 0	8 2	6 9	2 9	2 5	2 9
Edenburg	12 2½	10 4½	5 2	4 5	5 2	8 3	7 2	2 10	2 6	2 10
Bethany	12 3	10 5	5 3	4 6	5 3	8 4	7 3	3 0	2 7	3 0
Bloemfontein	12 3½	10 5½	5 6	4 9	5 6	8 5	7 4	3 4	2 10	3 4
Brandfort	12 4	10 6	5 10	4 11	5 9	8 8	7 5	3 8	3 0	3 7
Winburg Road	12 4½	10 6½	6 1	5 1	6 0	8 9	7 6	4 2	3 3	3 11
Ventersburg Road	12 5	10 7	6 5	5 4	6 2	8 10	7 7	4 5	3 5	4 0
Kroonstad	12 5½	10 7½	6 8	5 6	6 4	8 11	7 8	4 9	3 8	4 3
Heilbron	12 6	10 8	7 2	5 10	6 10	9 0	7 9	5 2	3 11	4 7
Viljoen's Drift	12 6½	10 8½	7 6	6 1	7 0	9 1	7 10	5 6	4 2	4 10

Through rates per 100 pounds between the colonial ports and stations in the Orange Free State, exclusive of cartage—Continued.

To—	From— Grahams Town (Port Alfred). 1	2	3	4	Wool, skins, hides.	East London. 1	2	3	4	Wool, skins, hides.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Donkerpoort	6 11¾	5 7½	2 2¾	1 10½	2 2¾	7 9	6 1½	2 6¼	2 1½	2 6¼
Priors	7 0¾	5 9¾	2 3¾	1 11	2 3¾	7 6	5 11¼	2 5½	2 0½	2 5½
Springfontein	7 5	5 10	2 5	2 1	2 5	7 2	5 9	2 4	2 0	2 4
Jagersfontein Road	7 6	6 0	2 6	2 2	2 6	7 3	5 11	2 5	2 1	2 5
Edenburg	7 7	6 6	2 8	2 4	2 8	7 4	6 3	2 7	2 3	2 7
Bethany	7 8	6 8	2 9	2 4	2 9	7 5	6 5	2 8	2 4	2 8
Bloemfontein	7 9	6 9	3 1	2 7	3 1	7 6	6 7	3 0	2 7	3 0
Brandfort	8 3	6 10	3 5	2 10	3 1	8 2	7 0	3 4	2 9	3 3
Winburg Road	8 4	7 0	3 9	3 0	3 6	8 3	7 1	3 8	2 11	3 5
Ventersburg Road	8 5	7 2	4 2	3 3	3 9	8 4	7 2	4 0	3 2	3 8
Kroonstad	8 6	7 3	4 6	3 5	4 0	8 5	7 3	4 5	3 4	3 10
Heilbron	8 7	7 5	4 11	3 9	4 4	8 6	7 4	4 9	3 8	4 3
Viljoen's Drift	8 8	7 6	5 3	3 11	4 7	8 7	7 5	5 1	3 11	4 6

Timber and undamageable iron, sugar, coffee, soap, rice, candles, imported flour, oatmeal in bags, fire bricks, cyanide of potassium, asbestus, buckets (mining), zinc ingots, mining jacks, and mining and other machinery (excepting agricultural, charges for which see classification) consigned from the forts to stations, Winburg Road to Viljoen's Drift inclusive, are charged 10 per cent off the second-class rates as shown, with the exception that the rates for timber per 100 pounds to Brandfort, Winburg Road, Ventersburg Road, and Kroonstad, exclusive of cartage, are:

To—	From— Cape Town.	Port Elizabeth.	Grahams Town (Port Alfred).	East London.
	s. d.	*s. d.*	*s. d.*	*s. d.*
Brandfort	7 8	5 7	5 2	5 2
Winburg Road	8 3	6 3	5 10	5 10
Ventersburg Road	8 10	6 10	6 5	6 5
Kroonstad	9 4	6 11	6 6	6 6

The rates per 100 pounds for mining and other machinery (excepting agricultural and machinery of colonial manufacture, charges for which see classification), sugar, coffee, rice, soap, candles, imported flour, oatmeal in bags, fire bricks, and cyanide of potassium, asbestus, buckets (mining), zinc ingots, and wagon jacks from the undermentioned stations, exclusive of cartage, are:

To—	From— Cape Town.	Port Elizabeth.	Grahams Town (Port Alfred).	East London.
	s. d.	*s. d.*	*s. d.*	*s. d.*
Donkerpoort	9 1½	6 0	5 7½	6 1½
Priors	9 1¾	6 3	5 9¾	5 11¼
Springfontein	9 2	6 5	5 10	5 9
Jagersfontein Road	9 2½	6 6½	6 0	5 11
Edenburg	9 3	6 7	6 2	6 3
Bethany	9 3½	6 7½	6 2½	6 3½
Bloemfontein	9 4	6 8	9 3	6 4
Brandfort	9 4½	6 8½	6 3½	6 4½

With the foregoing exceptions, clause 153 of the tariff book to apply to traffic for stations Donkerpoort to Brandfort, inclusive.

Cast-iron pipes, when declared undamageable, are conveyed to stations in the Orange Free State at the second-class rate, less 10 per cent, and the same rate applies to tubes and piping consigned from the ports.

The rates charged for goods between stations in the Cape Colony and those in the Orange Free State, other than those before mentioned, are the sum of the charge at the published tariff for the rail journey within the Cape Colony, 1 mile 1 chain beyond Norvals Pont station, and the local rate for the journey within the Free State, with the following exceptions, viz:

(1) Live stock and vehicles are charged at the ordinary mileage scale, according to distance, as per tariff applicable to the Cape Colony.

(2) Where charging at the rates from the ports of the respective systems—i. e., Cape Town for western, Port Elizabeth for midland, and East London for eastern system—amounts to less, the port rates are charged, except in the case of stations on the branch lines from which the distance is greater than from the port, when the local rate for the extra mileage is added to the port rate.

Special-class traffic.

For articles mentioned in clauses 145, 156, and 157 of the tariff book, when consigned from the ports to stations within the Orange Free State, the rates, according to class, are charged as shown above (fresh fish being chargeable at the fourth-class rate), excepting in the case of imported produce (clause 157), when a uniform rate of 3d. per ton per mile is charged for the entire mileage; when consigned from stations other than the ports, the same mileage rates are charged as within the Cape Colony.

Goods reconsigned from Bloemfontein to the Transvaal.

A rebate will be allowed on consignments sent by rail from Cape Town, Port Elizabeth, or East London to Bloemfontein, and subsequently sold there in bulk or in part lots to merchants and others resident in the South African Republic, on the weight sent by rail from Bloemfontein to the Transvaal, of the difference between the ordinary rates charged from the ports to Bloemfontein plus the rates Bloemfontein to destination, and the through rates from the respective ports to ultimate destination, less 6d. per 100 pounds for delivery, collection, and handling of the goods at Bloemfontein.

Senders consigning goods from Bloemfontein to stations in the South African Republic, on which they intend to claim the rebate before mentioned, must produce proof at the time that the goods were originally consigned to them by rail from the respective ports.

HIGHWAYS.

The Free State highways have an average width of 75 feet. They are neither paved nor macadamized; in fact, these highways are, in rainy seasons, in such a condition as to make traveling impossible. They are the worst roads that could be found in any civilized country. Goods over these highways are transported by means of ox wagons which can load up to 4 tons. The usual rate of freight is 24 cents per ton per mile.

Passengers are carried over these highways either by post carts or by private conveyance at the rate of 20 cents per mile.

E. R. LANDGRAF,
Consular Agent.

BLOEMFONTEIN, *July 28, 1894.*

NATAL.

OCEAN LINES.[1]

The Castle Mail Packet Company.[1]—The following are the names of the vessels of this company, together with their tonnage and horsepower:

Name.	Tons.	Approximate horsepower.	Name.	Tons.	Approximate horsepower.
Tantallon Castle	5,700	8,000	Drummond	3,705	3,600
Dunottar Castle	5,500	6,600	Garth	3,705	3,600
Arundel Castle	4,700	.....	Grantully Castle	3,489	3,300
Roslin Castle	4,350	4,800	Harlcote Castle	3,200	1,884
Norham Castle	4,392	5,100	Warwick Castle	2,957	2,500
Hawarden Castle	4,393	5,100	Dunbar Castle	2,700	1,620
Pembroke Castle	3,950	2,700	Mettwen Castle	2,700	1,620
Doune Castle	3,800	2,778	Courland	1,241	.....
Lismore Castle	3,800	2,778	Venice	511	.....

All these vessels are used in the ocean service, excepting the two last which are used in the coasting trade.

The rates of freight from London to South Africa are:

	Class I.	Class II.	Class III.	Class IV.
Mail steamers:	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
To Cape Town and Algoa Bay	47 6	33 9	25 0	22 6
To Mossel Bay, Knysna, and Kowie	52 6	38 9	30 0	27 6
To East London and Natal, including lighterage	55 0	41 3	32 6	30 6
To Delagoa Bay, including landing	57 6	45 0	42 6	37 6
Intermediate steamers:				
To Cape Town and Algoa Bay	45 0	32 6	25 0	22 6
To Mossel Bay, Knysna, and Kowie	50 0	37 6	30 0	27 6
To East London and Natal, including lighterage	52 6	40 0	32 6	30 0
To Delagoa Bay, including landing	57 6	45 0	42 6	37 6

The different classifications can be learned at any of the company's offices. The rates of freight homeward vary according to the class of goods.

The rates from Cape ports to Natal and between intermediate ports vary according to the class of goods, as follows:

Rate per ton from Cape Town up the coast.

From—	To— Mossel Bay.	To— Algoa Bay.	To— East London.	To— Natal.
Cape Town	*s.* *d.* to *s.* *d.* 10 0 to 17 6	*s.* *d.* to *s.* *d.* 10 0 to 15 0	*s.* *d.* to *s.* *d.* 14 0 to 20 0	*s.* *d.* to *s.* *d.* 12 6 to 22 6
Mossel Bay	.....	10 0 to 17 6	17 6 to 22 6	15 0 to 25 0
Algoa Bay	.....	.....	10 0 to 17 6	10 0 to 20 0
East London	.....	.....	.....	12 0 to 17 6

All freights with additional 10 per cent primage.

[1] Memorandum from the company's office at Durban supplied to the United States consular agent at that place.

RAILWAYS.[1]

The railways of the Colony of Natal are all owned and worked by the railway administration of the colony.

The termini of the existing lines are: (1) Charlestown, on the border of the South African Republic; (2) Harrismith, in the Orange Free State Republic; (3) Dundee coal fields; (4) Verulam, north coast line; (5) Isipingo, south coast line. A small map of the railways accompanies this memorandum.

The total length of the lines now open for traffic is 399 miles, and distances may be thus stated:

From Durban to—	Miles.	From Durban to—	Miles.
Pietermaritzburg (capital of the colony)	70¼	Coal fields	238½
Ladysmith	189¼	Verulam	19¼
Charlestown	306	Isipingo	11
Harrismith	249½		

The railways of the colony are all in first-class order, and are well equipped, and capable of conveying a much larger traffic than now passes over them. They are all single lines, on a 3 foot 6 inch gauge, and are laid throughout with steel rails, varying in weight from 45 to 62 pounds per yard. All intermediate stations, or nearly all, are crossing places, telegraph stations, and post-offices.

The frequency of communication varies according to the needs of the traffic and population. On the main line, between Durban and Charlestown and Harrismith, there is one through train each way daily, Sundays included, and goods trains according to the necessities of the traffic. Between Durban and Pietermaritzburg there are three trains daily. Between Durban and Verulam there are four trains, and between Durban and Isipingo three trains each way daily.

SUPPLEMENTARY INFORMATION.

Under date of May 9, 1895, Consular Agent Prince, of Durban, transmitted to the Department printed copies of the Natal port captain's report and the annual report of the Durban Chamber of Commerce, both publications being for the year 1894.

The following paragraphs are taken from the report of the Durban Chamber of Commerce:

NATAL RAILWAYS.

There are now open for public traffic in this colony 399½ miles of railway, all being single lines (with ample sidings and loop lines), on a gauge of 3 feet 6 inches, the whole being the property of and worked by the colonial government, under the general management of Mr. David Hunter.

---

[1] Memorandum supplied by General Manager Hunter, Durban, at the request of the United States consular agent.

BECHUANA LAND

PRETORIA

Middelburg

Coal

DE KAAP GOLD FIELDS

Barberton

Lorenzo Marquez

DELAGOA BAY

JOHANNESBURG

WITWATERSRAND GOLD FIELDS

SOUTH AFRICAN REPUBLIC

Wheat & Cattle

Heidelberg

194 M. to Barberton

Coal

SWAZI LAND

Usuen R.

MAPUTA LAND

POTCHEFSTROOM

Viljoens Drift

Vaal R.

Standerton

159 M. to Johannesburg

150 M. to Johannesburg

Heilbron

Charlestown 5100 ft. 304 M.

Pongola R.

285 M. Tugela 4100

Utrecht

Kroonstad

268 M. NEWCASTLE 3900 ft.

Vryheid

Buffalo R.

80 M. to Vryheid

Drakensberg Mountains

Majuba 4100 ft.

Coal

Wheat & Cattle

FREE STATE

Sand R.

Bethlehem

HARRISMITH 5300 ft. 249 M.

Glencoe Junction 4200 ft. 230 M.

237 M. Dundee 4000 ft.

ZULULAND

St Lucien L.

C. Vidal

ULUNDI

Umvolosi R.

Albertina 5400 ft. 234 M.

Reenen 5500 ft. 228 M.

Brakwall 4600 ft. 218 M.

189 M.

ADYSMITH 3300 ft.

Rorke's Drift

Pomeroy

Winburg

Tugela R.

Colenso 3200 ft. 173 M.

Mont aux Sources

Eshowe

Brandfort

Escourt 146 M. 3800 ft.

Mooi R.

Greytown

Cathkin Peak or Champagne Castle

NATAL

Caledon R.

Giant's Castle

125 M. Mooi River 4600 ft.

Stanger

Lower Tugela R.

Tugela R.

ORANGE WOOL

BLOEMFONTEIN

99 M.

86 M.

Lidgettown 4000 ft.

Howick 3400 ft.

BASUTO LAND

Wheat Maize

PIETERMARITZBURG 70½ M. 2216 ft.

19 M.

Verulam 170 ft.

Camperdown 45 M. 2500 ft.

31 M.

Botha's Hill 2400 ft.

17 M.

DURBAN The Bay

Richmond

Pinetown 1200 ft.

Isipingo R. 29 ft. 11 M.

Umkomanzi

Umzinto

100 M. to Kokstad

Hancocks Drift

GRIQUALAND EAST

Kokstad

Harding

THE MARBLE DELTA

Umzimkulu R. (Port Shepstone)

Aliwal North

Wheat

CAPE COLONY

PONDOLAND

Umtamvuna R.

Burghersdorp

Long. 30 E. of Greenwich

NATAL GOVERNMENT RAILWAYS

SHORTEST ROUTES TO THE GOLDFIELDS

SCALE OF MILES

0 10 20 30 40 50

DURBAN TO CHARLESTOWN	304	MILES
" " VERULAM	19	"
" " ISIPINGO	11	"
LADYSMITH TO HARRISMITH	60	"
GLENCOE JUNCTION TO DUNDEE	7	"

Natal Government Railways shewn thus
Other Railways " "
Proposed Railways " "
Coach Routes " "
Gold " "
Coal " "
Altitudes " " 4600 ft

A Hoen & Co. Lith. Baltimore

Our railways connect the port with the town of Durban (a distance of 2 miles), as also Durban with Verulam (19 miles), on the north coast, and Isipingo (11 miles), on the south coast, and the numerous sugar plantations en route to these coast towns; Pietermaritzburg (71 miles), the capital of the colony; Ladysmith (190 miles), the junction of the lines to the borders of the South African Republic and the Orange Free State; and Charlestown (Coldstream), on the border of the South African Republic (304 miles). There is a branch line (8 miles) from Glencoe Junction (231 miles from the port) to Dundee and the coal fields in that neighborhood, and another branch line to Harrismith (59½ miles from Ladysmith), Orange Free State.

Through passenger trains (first, second, and third class) are run every day from Durban to Harrismith and Charlestown, from which latter place conveyances leave for Heidelberg (98 miles) and Johannesburg (145 miles), as also direct conveyances for Barberton (180 miles) and Ermelo and other places en route.

Passenger trains leave Charlestown and Harrismith every afternoon, and Ladysmith twice every week day and once every Sunday for Durban; and the trains that leave Charlestown and Harrismith on Friday arrive here on Saturday morning in time to catch the outgoing steamer.

The M'Fongosi, New Republic, and Zululand gold fields may be reached in two to four days from here, by rail and horse conveyances. The Umzinto gold fields are situated about 55 miles from Durban, via Isipingo (by rail), from which place passenger carts run.

A general readjustment of rates will take place as soon as our railway is open to Johannesburg, when it may be reasonably expected that this colony will recover much of its trade, which has been temporarily diverted to Cape ports and Delagoa Bay.

The Delagoa Bay Railway has been opened and is now in full swing, and forms an important factor in the distribution of the South African import trade.

MAIL AND PASSENGER SERVICES.

On the connection at Johannesburg of our railway with the Cape and Delagoa Bay lines, our mails from and to Europe will be carried overland between Cape Town and Durban.

On the representations of the chamber, arrangements have been made by which if at least four passengers for Natal, arriving at Cape Town by any mail steamer, desire it, a carriage for their accommodation will accompany the mails overland from Cape Town to East London.

The chief want now felt in connection with the passenger traffic from Cape Town seems to be a quicker steamship service, and it is reasonable to hope that, in the near future, arrangements will be made by which steamers for the purpose will do the trip from Cape Town to Durban in from two and one-half to three days.

PORTUGUESE MAIL CONTRACT.

This colony still labors under the injustice of paying higher rates for passengers and freights from London than are paid from Lisbon to Delagoa Bay by the same steamers, but this inconsistency must soon remedy itself.

INCREASE OF STEAMSHIP FREIGHTS FROM EUROPE.

In February the steamship companies trading to south Africa made certain increases in the rates of freight upon goods from British ports to south African ports. These increases were resented generally in south Africa as being unjustifiable, and exception was taken to their being brought into operation without the promised notice being given to shippers. Correspondence with the South African Merchants' Committee in London and others was submitted to a meeting of this Chamber on June 4, and the following resolution was adopted:

"That this chamber can not agree to the contention of the steamship companies as to the reason for increase of rates, and recommends the reconstruction of the

South African Merchants' Committee in London by the substitution of elected representatives chosen by chambers of commerce at each port from Cape Town to Delagoa Bay, and that the various chambers be communicated with for the purpose of arranging details."

The chambers of commerce at other south African ports were communicated with, but no agreement was arrived at.

CABLE RATES.

For some years past the chamber has been urging upon Government the desirability of a reduction in cable rates. As the result of negotiations between Sir James Sivewright and the several South African governments, it has been arranged that from April 1 the cable rates shall be reduced to 5s. per word for the public and 2s. 6d. and 1s. 6d. for Government and press work, respectively, on the payment of subsidies to the Eastern Telegraph Company of £15,000 by the Cape Colony, £10,000 by the Transvaal, and £5,000 by Natal. It appears to the chamber that the contribution by Natal is too large in proportion to that by the Cape and the Transvaal, but in any case the reduction in rates will be generally welcomed.

CENTRAL AFRICA (BRITISH.)

According to a report to the British foreign office by Commissioner Johnston, dated Zomba, March 31, 1894, British Central Africa is the name given to a considerable area of south-central Africa which lies for the most part within the northern basin of the Zambesi, but which also includes within its limits a considerable part of the watershed of the Upper Kongo. It is bounded on the north by the Kongo Free State, the waters of Tanganyika, and German East Africa; on the east by the German and Portuguese East African possessions; on the south by the Portuguese possessions on the Zambesi, by the middle course of the Zambesi River, and by German Southwest Africa; and on the west by the Portuguese Province of Angola.

Following are extracts from Commissioner Johnston's report:

It is almost unnecessary to call attention to the fact that the part of Africa now under review is a land of great lakes. Lake Tanganyika, which forms part of the northern limit of British Central Africa, is over 400 miles in length, and varies from 60 to 30 miles in breadth. Lake Nyassa, the next in size, and the third biggest lake in Africa, is about 360 miles long, and varies from 13 to 40 miles in breadth. Lake Mweru, according to Mr. Sharpe's latest survey, has a total length of 68 miles (from entrance to exit of Luapula) and an average breadth of 24 miles. As to area of the mysterious Lake Bangweolo, it is difficult to pronounce an opinion. Its approximate area of open water during the dry season is 1,672 square miles, though immediately after the heavy rains of January and February it is probable that the area is doubled by the rise of water over the extensive marshy country lying to the south of Lake Bangweolo.

Although it lies outside the limits of British Central Africa, I might allude to the extensive and curious salt lake, Rukwa, which is situated not far distant from our northern boundary. This lake is about 120 miles long, and averages 12 miles broad. Its southern end opens out into a number of small gulfs. This lake is evidently but a shrunken remnant of what was once a large sheet of fresh water, probably draining into the Songwe Valley and Lake Nyassa. Between Lakes Tanganyika and Mweru,

is a salt lake, also called Mweru. In the dry season this lake would appear to be reduced to an enormous marsh, while in the height of the rainy season it probably presents, in the central portion, stretches of open water. Mr. Sharpe, who was its discoverer, states that canoes can not penetrate the thick encircling reed belts of this swamp. In the southeastern part of the protectorate, between the south end of Lake Nyassa and the Mlanje Mountain, lies the salt lake usually known by the name of Shirwa. It is very difficult to decide to what river system Lake Shirwa was attached in bygone years. Between its northeast corner and the valley of the Upper Shire, is a plain, which in parts perhaps does not rise more than 50 feet above the Shire.

The Zambesi is, of course, the most important stream through British Central Africa as regards length of course and volume, though, owing to the extension of Portuguese territory over part of its northern basin, it is very much cut off from present contact with our influence, and is, consequently, far less thought of and talked about than the Shire, which we regard as our own peculiar river. The Zambesi is dubiously navigable for canoes from the junction of the Kabompo on the north to Sesheke near the junction of the Tshobe; after that, supervene the rapids and the grand Victoria Falls. The navigability of the river is not resumed, at least in any appreciable extent, until a place called Mwankis is reached. From Mwankis to the Kansalo Rapids I believe canoes and boats can proceed for a certain distance, but the best stretch of the river in the interior for more or less continuous navigation, where I am told it is possible for steam launches to ply, is from the confluence of the Kafue, past Zumbo, to the rapids about 40 miles below Zumbo, which are sometimes called the Perizengi Rapids. This stretch will, in future, be of some importance to British Central Africa. Below the Perizengi Rapids, all idea of navigation has to be abandoned until one reaches near Tete. From Tete to the junction of the Zambesi and the Shire, the river is more or less navigable for canoes all the year round, though great difficulties are experienced in the dry season in the Lupata gorge below Tete, where the breadth of the river is restricted to about 60 yards, and where the velocity of the current is 4 to 6 miles an hour. From Tete to the junction of the Shire, the river can only be navigated by steamers from six weeks to three months every year, during the rains, in December, January, and February. From the junction of the Shire and the Zambesi to the Chinde mouth, on the Indian Ocean, the river is navigable for steamers of light draft, I mean, not drawing more than 2 feet. In the time of full river, vessels of 5 feet and more can navigate the lower Zambesi and the lower Shire.

The whole valley of the Zambesi, from the confluence of the Kabompo to the head of its delta, seems to be unhealthy for Europeans, in parts, singularly unhealthy. Otherwise it should become, by development, one of the richest regions in the world, as it affords evidence of great mineral wealth, especially coal, and, in parts, gold; and in all its districts along the lower and extreme upper course the land on its banks is extremely fertile, and in many respects resembles the Lower Nile Valley from the fact that its fertility is incessantly renewed by the deposit during the floods of the alluvium brought down from the hills.

The river next to the Zambesi in importance, though not in length, is the Shire, so well known that it seems almost superfluous to give much information about it. Still, it may be mentioned that the Shire is navigable for boats and canoes all the year round from Chikwawa, just below the Murchison Falls, to its junction with the Zambesi. In the height of the dry season, the continuous navigation of the Shire up to Chiromo is suspended for steamers, which have to ply between Chiromo and Pinda Island and exchange their goods to the other steamers that ply between Pinda Island and Chinde. The transshipment of goods across Pinda Island is a source of much trouble, loss, and vexatious disputes with the Portuguese. The Murchison Falls of the Shire are well known. During their extent the Shire descends about 1,000 feet. There are one or two little breaks in between the falls which are navigable for canoes, but not to any extent worth speaking of.

The navigability of the upper Shire extends from the exit from Lake Nyassa to a mile or so below Matope, the African Lakes Company's station. The stretch of river between Lake Nyassa and Malombe is navigable for steamers of considerable draft all through the year. The difficulties of navigation in Malombe have already been mentioned. Nevertheless, Malombe can be crossed at all seasons of the year by steamers drawing not more than 1 foot 9 inches, and in the rainy season by those drawing 5 feet. Below Malombe the upper Shire is fairly navigable, even for steamers drawing 2 feet, all the year round. There are only one or two places where any difficulties are met with. One is a spot known as the "Stones," a little below Fort Liwonde. Here a bed of rocks crosses the river and in one or two places, the rocks reach the surface of the water and constitute a danger rather in the full river than with the low, because at low water they can be easily seen and avoided. A little below the stones there is a broad sand bank which stretches nearly the whole way across the river. This is opposite the place known as Fort Sharpe, which, indeed, was built because the steamers were always sticking on the sand bank, and were at one time exposed to annoyance from unruly natives. Nevertheless, broadly speaking, the upper Shire is navigable all the year round from Lake Nyassa to Matope (which is 31 miles from Blantyre) for steamers which draw no more than Her Majesty's ship *Dove* (which is, I think, about 1 foot 9 inches). Unfortunately, the entrance to the Shire from Lake Nyassa is somewhat hindered by a bar of sand, which, in the dry season, has only from 3 feet 9 inches to 4 feet of water on it. This bar greatly hinders the entrance to the Shire of the Lake Nyassa steamers, these latter requiring to draw from 4 to 5 feet of water in order to have sufficient stability in the stormy waters of that lake.

The next river in importance to the Shire is the Luapula, or upper Kongo, which, under the name of Chambesi, takes its rise in innumerable streams on the northern edges of the Nyassa-Tanganyika plateau. From information which I have received from natives I am inclined to believe that the Chambezi, or Upper Luapula, is comparatively free from rapids, and is navigable for canoes, and, in its lower course, for boats drawing about 2 feet of water, and would thus afford a waterway leading straight into Lake Bangweolo and out again into Luapula, which, again, would be navigable for a little distance beyond the Lohombo. In its most southern reaches, the navigation of the Luapula is stopped by the Mambirima Falls. As far as we can learn, the navigability continues, uninterrupted by rapids or falls, until a point near latitude 10° 30′, where Mr. Sharpe discovered a series of rapids, acting as a complete bar to navigation, which he named the Johnston Falls. From these falls, right into Lake Mweru, there were no other obstacles in the river, which appears to be navigable for boats drawing considerable water. Lake Mweru is, of course, perfectly navigable even for big steamers throughout its whole length, but the Luapula, after it leaves Mweru, is again obstructed by rapids.

The Luangwa (sometimes known as the Aruangwa) River, which is one of the most considerable affluents of the Zambesi, is fairly navigable for canoes and rafts from below its junction with the Mapamanzi down to the Zambesi. In the dry season, however, navigation is stopped by a series of rapids situated at some distance north of the confluence of the Luangwa with the Lunsefwa, but I am informed by M. Carl Wiese that these rapids can be passed during the high river, and that the black Portuguese traders are in the habit of using the Luangwa River for about half its course as a means of transporting their ivory and other articles of trade down to the Zambesi, which they do by building rafts.

About the navigability of the Kafue River we know almost nothing. As it flows through a very mountainous country, I should say it is probable that the river can not be navigated even by canoes far above its confluence with the Zambesi.

The Ruo, except in a few patches, is quite unnavigable. I am informed that the Bua River, which flows into the southwest of Lake Nyassa, can be navigated for some distance by canoes, and the same is said about the River Rukuru, which flows into the northwest part of the lake.

According to the accounts of Livingstone, a good many of the streams which flow into the northeastern part of Bangweolo can be ascended for some distance in canoes. The River Lofu, which flows into the south end of Lake Tanganyika, has been ascended by myself for about 15 to 20 miles in a large boat. None of the other rivers in this part of Africa, so far as I am aware, afford any permanent navigability even for native canoes. I think it is hardly necessary to point out that none of these rivers can vie with the Kongo or its great tributaries for facilities of navigation; on the other hand, so much of the Shire and Zambesi as can be navigated does not offer greater difficulties than may be met in the Niger and Benue, and perhaps has a less marked deficiency of water in the dry season.

So far as the observations of Mr. Crawshay extend in relation to the somewhat sterile districts stretching between Lakes Mweru and Tanganyika, there is the nearest approach in that region to anything like desert which can be found in this part of Africa. There is also a dry and little-watered country in the vicinity of the lower Shire, and possibly along the northern bank of the central Zambesi.

Perhaps the greatest curse which nature has laid on this and other parts of south-central Africa is the existence of the tsetse fly. Were it not for this the value of the country would be centupled. In the first place, the difficulties of colonization would be solved, and also the difficulties of that conquest which must sooner or later take place if the slave-raiding tribes are to be kept under control. At present it is only over small and widely separated patches that horses and cattle can be kept free from the attacks of the tsetse fly. For instance, there is no tsetse fly on the road from Katunga to Zomba, a distance of over 60 miles. The convenience of this may be estimated from the fact that I can ride from Katunga to Zomba, with a change of horses, in two days, whereas it would take me three day's hard and very uncomfortable traveling to perform this journey in a machilla.[1] On the other hand, I can not ride over to Mlanje, which is only some 40 miles distant, because there is a belt of tsetse-haunted country in between. Neither can I ride the short distance of 21 miles to the upper Shire, for the same reason. Were it not for this, we could keep the whole Shire province under control by a small troop of fifty mounted police. Nevertheless, we may be thankful that when proper precautions are taken it is quite possible, and not even very difficult, to introduce horses into the Shire highlands. The tsetse fly appears never to go near the edge of a river or to fly over a river. Consequently, when horses and cattle are being brought up in steamers they are not attacked by the tsetse as long as they do not leave the river; and inasmuch as the piece of shore between Katunga and Chikwawa is free from tsetses, we are able to land horses there and send them up into the highlands, where the fly is absent. By taking the horses down at night through the fly belt between Zomba and the upper Shire to Mpimbi and embarking the beasts at once, they could also be got up to Lake Nyassa without being bitten. There is a considerable area around Fort Johnston and the south end of Lake Nyassa where there is no tsetse fly, and nearly all the country along the eastern shore of the lake is without this pest. On the contrary, the tsetse occurs in patches along the west coast, but is quite absent from the north end of the lake. The southern shore of Lake Tanganyika is infested with the fly, which kills even dogs, goats, and donkeys, the two latter beasts generally escaping. The fly is scarcely ever found above 3,000 feet. The Luangwa Valley, on the other hand, is full of tsetse; so are certain portions of the Zambesi banks.

There is one hope as regards the extermination of this fly, and that is that it always dislikes the presence of human beings and avoids human settlements. It also seems to depend for its existence on large herds of game. Therefore, by increased settlement and population of the country and the reducing the herds of wild animals, we may hope in time to exterminate the tsetse to the same extent as it has by past action of man been got rid of throughout the Soudan, where one never hears of it, and likewise in the regions of the Niger.

---

[1] A hammock carried by native porters.

In 1891, not counting the British and Portuguese gunboats, there were three steamers plying on the Zambesi and lower Shire, three steamers on Lake Nyassa, and one steamer on Lake Tanganyika. All the Nyassa and Tanganyika steamers were British, and of the others on the Zambesi and Shire one was Dutch and two were British. At the close of the year 1893 there remained one British steamer on Tanganyika, but on Nyassa, besides the three British gunboats (one of which plies the upper Shire), there were four other steamers on that lake, one German and three British. On the Zambesi-Shire there are now no less than six steamers, all of which are British. The Dutch steamer already mentioned is no longer in existence. One of the steamers, now called British, was originally a German boat, the *Pfeil*, but I believe I am right in stating that this vessel is now a British steamer and belongs to the African Lakes Company. I think there are three Portuguese gunboats, if not more, on the Zambesi, and there are the two British gunboats, the well-known *Herald* and *Mosquito*. At Chinde there are two tugs, which either ply between the river and the sea at that place or run to Quilimane, connecting with those steamers which are too large to cross the Chinde bar, or exchanging cargo and passengers with the ocean steamers in smooth weather outside the bar. I am informed that there are no less than 100 barges and lighters now on the Zambesi-Shire, of which about 80 belong to British traders.

The British concession at Chinde has attained a marked development since it was first made over to us at the beginning of 1892. A good deal of marsh has been drained, groins have been built to protect the foreshore, and an attempt has been made—not very successful as yet—to create a small dry dock for the repair of the gunboats and river steamers.

The dangers and difficulties of the Chinde bar have been from the very first persistently exaggerated. At one time the Union and Castle lines of South Africa stopped all communication with Chinde, and the German East African Line had not commenced its service. At this juncture Mr. Rennie's line of Aberdeen steamers came to the rescue, and the *Induna* began to run from Natal to Chinde. This may be said to have turned the tide in our favor. Finding that the *Induna* did not come to grief, the German line next proceeded to call; and, last of all, the Union Company established a service to Chinde on more or less fixed dates.

Before leaving the subject of water transport, I might complete my list of the means of locomotion at present available on lakes and rivers by stating that the London Missionary Society has a large sailing boat in addition to its steamer on Lake Tanganyika, and the administration is now conveying to that lake an iron sailing boat in sections for use at the south end of Tanganyika, and also a boat of the same description for Mweru. We have already one sailing boat on Lake Mweru, which is very useful for visiting the upper Luapula. On Lake Nyassa, besides the steamers mentioned, there are three or four lighters belonging to the African Lakes Corporation, and two large boats (one of them a kind of steam launch) belonging to the Universities' Mission; the German Government also has a huge barge. The administration has a lifeboat at Deep Bay and a good-sized boat attached to the Fort Maguire Station; and in addition four large boats and three small ones on the upper Shire, besides two barges and five boats on the lower Shire and two on the Ruo—one, at Fort Anderson and one at Chiromo. Perhaps it may be interesting to give the names of some of our boats, by which I have tried to commemorate celebrated African explorers connected with British enterprises in Central Africa. We have the *Henry Barth*, the *John Kirk*, the *Fred Elton*, the *Richard Burton*, the *Speke*, the *Grant*, the *Alfred Sharpe*, the *Joseph Thomson*, the *Bruce*, the *John Buchanan*, etc.

The administration had not long started when the question of overland transport was brought prominently before it. At first I was in favor of constructing a carriageable road direct from Chiromo to Zomba and thence to the upper Shire, because the Shire above Chiromo is so difficult of navigation during certain months of the year. The construction of this road was commenced, and it was decided that it should pass close to Mlanje, so as to open up communication with that important

district, but the difficulties were so great that but little progress has been made with this direct road up to the time of writing, though I have given out one or two sections by contract. It was soon decided that it was of far more benefit to the community that the road between Katunga and Blantyre should be made thoroughly practicable for wagons. In consequence, Captain Sclater constructed what is now called the "Sclater road," between Blantyre and Chikwawa. This road was at first intended to be little more than an enlargement of the old track cut by the African Lakes Company down to Katunga, but this track was found to follow such a steep incline in many places that it had to be abandoned and, in consequence, about two-thirds of the road from Blantyre to the lower Shire is of new and independent construction. This road has cost the administration a little over £2,000 to construct, and can scarcely be pronounced to be finished yet, not being properly connected with Katunga. However, it is practicable for wagons, and, in consequence, is of immense benefit to the community, especially in the transport of heavy goods. An excellent road has also been made at a much less expenditure between Zomba and Blantyre, and in this way Zomba is connected with the lower Shire by a carriage road.

A rough track has been cut from Zomba down to the upper Shire which is sufficient for passenger traffic but quite unsuited to wagons owing to the steep descent in parts. It has not been worth while making this road carriageable, because the tsetse fly is found over a portion of it. A considerable section of the road between Zomba and Mlanje has been made by Captain Edwards, and would have been finished at the present time but for the violence of the rainy season, which, since December, has caused all road work to be suspended. This road from Zomba to Mlanje is intended to be a section of the direct route to Chiromo. Short lengths of road have also been cut between different places on the upper Shire. Except, however, between the lower Shire and Blantyre-Zomba, one is not encouraged to spend hundreds of pounds on the making of a carriageable road, because of the presence, in various tracts, of the tsetse fly, which would render the passage of horses or oxen too risky for them to be constantly used as a means of transport. I fear the only certain and practical way of opening up communications with this country will be by railway running between the lower and the upper Shire.

The postal service was first established by me, acting for the British South Africa Company, in July, 1891. Prior to that date, there was no postal service whatever in the country, though the African Lakes Company, in an informal manner, usually carried the greater proportion of the mails. All letters, however, for the exterior, had to be posted at Quilimane and stamped with Portuguese stamps. The British South Africa Company's postal service in British Central Africa now extends from Chinde on the seacoast to Lake Tanganyika and Lake Mweru; and a monthly service is also being organized by the collector of the Mweru district for the transmission of letters to the authorities of the Kongo Free State in Katunga. All letters, newspapers, and other mail matter coming from the exterior are accepted at the rates in force in the countries of origin.

RECENT PROGRESS IN CENTRAL AFRICA.

The following extracts from the annual report of the British acting consul-general at Zomba, February 7, 1895, give information of developments in central Africa since the date of Commissioner Johnston's report:

Steamers, barges, etc., on rivers and lakes.—At the end of 1894 there were, upon the lower Shire and Zambesi rivers, not including gunboats, nine steamers plying, three of which were built in 1894. The number of barges and cargo boats has also been considerably increased. On the upper Shire one new steamer, the twin-screw steamship *Livingstone*, has been built during the past year; several new barges and boats have also been built on the upper Shire, and several vessels for use on Lake Nyassa.

Another steamer, the property of the German missionaries, has been constructed for use at the north end of Lake Nyassa. A steel sailing vessel has been placed on Lake Tanganyika by the African Lakes Corporation, Limited, which is intended to open up trade between the south end of that lake and the ports on its eastern, western, and northern shores.

Transport.—A serious question which appears at present likely to retard the progress of the country is the want of satisfactory transport from the Shire Highlands to what may be considered the head of navigation on the Shire River, Chiromo. The whole coffee crop of the country has to be transported down to Chiromo during the months of September and October, and even with the present crops it is found a difficulty. As each year, the quantity to be carried will be largely increased it is to be feared that in the year 1896 (at any rate) there will be great difficulty experienced in getting the produce of the country down to Chiromo before the rainy season commences. What is needed is a light railway from Chiromo to Blantyre; it appears, in fact, to be an absolute necessity, unless the advance of the country is to be materially checked. The length of such railway would be about 70 miles, and the cost probably between £150,000 and £200,000.

Horses, cattle, etc.—The Shire highlands have proved healthy for horses, mules, and cattle. A considerable number of horses have been imported from south Africa during the past year. Care has to be taken in their treatment on the journey up from the seacoast to Blantyre, and delays on this portion of the route have to be avoided; when once, however, they arrive in the Shire highlands they are found to be freer from sickness than in south Africa. With the importation of horses, and the improved roads, locomotion has become an easier matter in the Shire highlands than it used to be. In addition to wagon traffic, a Cape cart at the present date runs occasionally with passengers from Katunga, on the Shire, to Blantyre and Zomba, traveling at an average rate throughout of 7 to 8 miles per hour. Cattle have been imported to the Shire highlands in considerable numbers during the past year from districts west of Lake Nyassa, and from the German territory at the north end of the lake. The local German government, however, has recently prohibited the export of cattle from their north Nyassa regions.

Telegraph.—The first section of the African transcontinental telegraph line between Blantyre and Chikwawa was opened in September last. The second section of the permanent line, between Chikwawa and Tete, on the Zambesi, is now almost completed, and for some time past there has been communication with Tete by means of a temporary wire.

The port of Chinde.—This port is rapidly growing in importance, both as a transit station for merchandise going to and from central Africa, and also as a port for the shipment of merchandise to and from the Portuguese territory on the banks of the Zambesi River. The port of Chinde is Portuguese, but has been brought into existence chiefly owing to the fact that British Central Africa required an outlet at the mouth of the Zambesi. The total exports from the port for the year 1893 were valued at £10,201, the total imports being £9,147. In 1894 these rose, respectively, to £22,236 and £13,737.

Freights from Chinde to Chiromo average about £4 per ton, passages being £7 per person; freights from Chinde to Blantyre, £8 per ton, passages £12; freights from Chinde to Lake Nyassa (Fort Johnston), £15 per ton, passages £16.

Bank.—During the past year banking operations have been commenced in British Central Africa by the African Lakes Corporation, Limited. They have established a bank at Blantyre, with a branch at Chinde. This has done much to facilitate mercantile business.

Postal.—The amount of matter transported by the postal service of British Central Africa has increased largely during the past year. Taking the month of November, 1894 (as an average month), the total number of articles carried, including post cards, letters, newspapers, and parcels inward and outward, was 25,592, as compared with 19,383 in November, 1893. In addition to this, the postal service of

British Central Africa has carried gratuitously sealed bags of correspondence to and from Her Majesty's gunboats on Lake Nyassa.

During the year there have been established new post-offices at Bandawa (Nyassa) Kota-Kota (Nyassa), Fort Rosebery (Luapula River). A monthly service has been established to and from Katunga via Lake Mweru.

The parcels post, which was established in 1894, has been found of great service, and the rate of parcels to England has been recently reduced from 1s. 9d. to 1s. 6d. per pound. Arrangements have been made for the extension of the parcels post between the British Central Africa Protectorate and Zanzibar, India, and Aden, which will come into operation on April 1, 1895. Steps are now being taken for the establishment of a money-order system throughout the post-offices in British Central Africa. Post cards for internal circulation and for external (to Great Britain) have been introduced. English mails reach Blantyre about once a fortnight, a monthly mail coming via Cape Town, and a monthly mail coming via Zanzibar.

The postal service of this protectorate and sphere still shows an annual loss. This is due to the fact that incoming mails are only carried to the port of Chinde at the expense of the country of origin, and the heavy cost of carrying such mails from Chinde throughout British Central Africa and the lake districts is borne by the British Central Africa postal service. As an example of the heavy bulk of postal matter constantly being carried for great distances in this country, I may instance a mail which reached Tanganyika from Chinde on November 26, 1894, which weighed over 4 hundredweight, this having been transported for over 1,000 miles from the coast, for a considerable portion of which it was carried on the heads of native carriers.

Indian traders.—During the past year a number of Indian traders, locally and on the African coast known as Banyans, have settled in British Central Africa, at Chiromo, Chikwawa, and Blantyre. It is probable that before long they will have established stores at the south end of Lake Nyassa. The presence of these men does a great deal toward encouraging small trade on the part of the natives of this country, as not only do the natives prefer trading with a Banyan to a European, but the Banyans are always ready to transact any business, however small. In concluding this short report, I may say that, although the market of British Central Africa is not as yet a very large one, trade is increasing with such rapidity that there is every prospect of its being before long a market well worth consideration on the part of our merchants at home.

ANNUAL REPORT ON CHINDE.

Each year shows a steady increase of the importance of Chinde as a transit station for merchandise going to central Africa. To British people it is especially important, owing to its extended water communication with British Central Africa, it being, at present, the only navigable mouth of the Zambesi. As the town of Chinde is only 1 mile from the sea, the coasting steamers, after entering the harbor, are enabled to discharge cargo direct into the river steamers and lighters, which convey same to the interior. The British concession is a piece of ground on the south bank of the river, with river frontage of one-fourth mile, and a fall back of 260 yards from the foreshore granted by the Portuguese Government to H. H. Johnstone, C. B., in the latter part of 1891. It is of great importance to all shippers of through cargo to English territory. This concession has been divided into several small plots of about 800 square yards each, which are sublet to the various traffic companies and merchants for the purpose of building bonded stores for their goods in transit. Thus merchandise for British Central Africa not immediately transshipped to the interior can be landed, stored, and afterwards forwarded free of all duties or other charges. To give some idea how great a benefit this concession is to business people shipping goods to British Central Africa, where one small iron store existed at the beginning of 1892, there now stand large iron warehouses which nearly half cover the whole concession.

Another great point to everyone's advantage is being able to avoid the old-fashioned, tedious boat journey up the Quaqua or Quchmane River when that port was the only recognized entrance for passengers and cargo bound for central Africa, and which journey often took as long in the dry season as six to eight days through the most uninteresting part of the country, infested by mosquitos and other venomous insects, to arrive at the end after a journey of about 4 miles overland at a point on the Zambesi (Vicente) which any of the river steamers can easily reach after leaving Chinde in one and one-half to two days.

The principal steamship lines running here are the Union Steamship Company every month, and J. F. Rennie & Sons every three weeks from the south, and the Deuch East Africa Line and the Union Steamship Company every month from the north. Besides the vessels of the above-mentioned companies, other steamers have arrived during the year specially chartered by various firms direct from home. In cases where steamers are too large to cross the bar at the entrance of the river, connection is made by a steam tug stationed here. For passenger traffic, the majority of the Union Steamship Company's steamers which call could not be improved on.

The Chinde harbor is a good one, with plenty of water for a large number of vessels of deep draft. There are two large hulks moored in the harbor, both of which belong to British firms. They are of much service, as the coasting steamers can go alongside to discharge their cargo direct into them, and the river steamers load in a similar manner, and vice versa.

The harbor is excellent, being as good if not better than that of any harbor on the coast. There are several powerful steam launches and steel lighters of large capacity.

The flotilla for river traffic has been greatly increased during the past year by many new stern-wheel steamers and steel lighters of shallow draft capable of carrying large quantities of cargo. Experience has taught that the best method of taking large quantities of cargo to the interior is for stern-wheel steamers to tow lighters on either side; much better than side-paddle steamers towing astern.

The principal inland traffic companies are the African Lakes Corporation, Limited, and Sharrer's Zambesi Traffic Company.

Chinde is connected with Quilimane by telegraph, and thus has connection with Chiromo, on the Shire, and Tete, on the Zambesi, including all the intermediate stations.

There is a Portuguese post-office in Chinde, through which postal matter for Portuguese territory is forwarded; all other mails are sent to the British post-office.

The postal-exchange office for British Central Africa is situated in the British concession, there being resident a head postmaster and postmaster. The mails are made up and exchanged with Europe, India, and south and east Africa.

BLOCKING THE OLD SLAVE ROUTES.

The London Times of May 14, 1895, in an account of recent military operations in Nyassaland against slave traders, states that immediately after they had been concluded steps were taken to establish a new administration station and fort on Chikala. "This," adds the Times, "will form the northernmost of the line of posts which block the old slave routes to the east coast, and will effectually control the whole country between the northwest end of Lake Shirwa and the south end of Lake Nyassa."

GERMAN COLONIES IN AFRICA.[1]

In April, 1884, Prince Bismarck gave official recognition to the beginning of the German Colonial Empire by his dispatch to the German consul at Cape Town announcing the establishment of a German protectorate over what was then known as Luderitzland, a settlement founded in 1882 on the west African coast, north of the Orange River, by a Bremen merchant, Herr Lüderitz. This step was quickly followed by similar movements. The Togoland and Cameroons protectorates were proclaimed by Dr. Nachtigal in July, 1884; German East Africa made a start at the end of the same year, and 1885 saw German protectorates established in New Guinea and in the Marshall Islands, in the South Pacific Ocean.

Ten years have now elapsed since this beginning was made, a period sufficient to allow of stock being taken of the work already accomplished by the youngest of the colonizing powers, and of an opinion being formed as to the success of the enterprise.

The frontiers of all the possessions acquired by Germany, amounting to about five times the superficial area of the Fatherland, have now been definitely delimitated, with the exception of the Togo-Hinterland; and the local administrations, no longer preoccupied with the question how best to take part in the scramble for Africa, will now be able to give a more exclusive attention to consolidating German power and developing the resources of the districts under their charge.

TOGOLAND.

The colony of Togoland is situated on the Slave Coast, in the Gulf of Guinea, with a coast line, often very difficult of access, 52 kilometers in length, extending from the frontier of the French colony of Dahomey and its dependencies, longitude 1° 41′ east of Greenwich, to the frontier of the transvolta province of the British Gold Coast Colony. On the east longitude 1° 41′ is the boundary; on the west the frontier trends in a westerly direction till it strikes the River Volta, at about 6° 40′ north latitude, and then follows the left bank of the Volta until that river enters the Anglo-German neutral zone; thence the western frontier runs due east along the south limit of the neutral zone, and then trends northward. As stated above, the northern frontier of Togoland in the direction of Tschantoland is still undefined, and the total area of the colony can not, therefore, be stated; but the territory hitherto claimed by Germany is estimated at 60,000 square kilometers.

Sebbe, the capital, lies near the eastern frontier of the colony, but has little commercial importance. The trade of the colony is centered at Klein Popo.

---

[1] Extracts from report of British embassy at Berlin, October 26, 1894.

Lome is also a thriving town, with no less than fourteen of the twenty-four factories working in the colony. Other coast towns are Porto Seguro and Bagida. Kratschi, an important trade center on the western frontier, a little to the south of the neutral zone, and Kpando, lower down the Volta Valley, are the largest emporia in the Hinterland.

On March 1, 1888, the first postal agency was opened in Klein Popo. There had previously been a messenger service, organized by the governor, between Klein Popo and Quittah, in the Gold Coast Colony, which was intrusted to the Houssa police. This was, however, found too onerous, as it monopolized the service and time of ten out of the twenty-five men of which the force consisted. The head agency at Quittah of the Bremen firm of Vietor & Sons consequently undertook to convey the German overland mails from that town to Klein Popo, and vice versa, three times every fortnight, and the arrangement is found to work very satisfactorily. In March, 1890, a second postal agency was opened at Lome.

Besides this overland route from Accra and Quittah, the steamers of the Woermann and English lines deliver and accept mails whenever possible. (This is not often the case in bad weather.) Postal parcels can, however, be forwarded only by the Woermann line, and must be landed at Klein Popo or Lome and not at the neighboring British ports.

There is also a weekly post eastward with Agoue, Grand Povo, Kotono, and Porto Novo, in the neighboring French protectorate, which is of use not only for local purposes but for forwarding correspondence by the French packets to Bordeaux.

Togoland is now connected with the Gold Coast Colony by a telegraph line 50 kilometers long, from Klein Popo, via Lome, to the British frontier, and thence by the African Direct Telegraph Company's cable with Europe. The line from Lome to Quittah was opened on January 9, 1894, and the extension to Klein Popo shortly afterwards. Since April last there has also been opened a telephone between Klein Popo, Lome, and Shebbe (communication with the latter town being reserved for official use only).

Togoland, as well as all the other German colonies, have joined the International Postal Union. In the interior of each colony the postal rates are the same as in Germany.

To show the progress already made by Togoland, I may, in conclusion, summarize a letter of Herr Vietor, a Bremen merchant long connected with the Slave Coast, which was published a short time back in the Reichsbote. He begins by contrasting the Togo of to-day with the Togo of 1884:

> In 1884 it was a mere wilderness with four small factories on the coast, of which Klein Popo alone had the slightest importance. There were then at Klein Popo three German firms, of which one shortly afterwards retired, one English, and two French houses. There were not more than three, or at most four, decent dwelling houses. There was, indeed, an English mission, but it was managed by black missionaries. Europeans lived there on sufferance, and had several times to claim pro-

tection from German ships. There was no idea of planting trees or forming plantations; not a tree was to be seen even in the courtyards of the few houses which existed.

And what has ten years of German rule effected? There is, first of all, perfect security, and no longer any question of dependence on native chieftains. Instead of three, there are now at least ten German firms, with thirteen houses, while the two French houses have each started another subsidiary establishment, not to speak of the new Government buildings. Almost all the Europeans have comfortable dwelling houses. Besides the little mission alluded to above, there is now the Bremen mission and two or more Catholic missions on the coast. From Lome and Klein Popo, fine wide roads lead into the interior. Cocoanut plantations fringe the whole coast, while inland from Shebbe there is a whole series of coffee plantations. In the coast towns there is a local police, while a small body of constabulary keep order in the interior. In Klein Popo there is a Government school and a Government doctor; road making and arboriculture are both going ahead, and excepting the salary of the governor and his secretary all this is paid for out of the colony's own income.

CAMEROONS.

The colony of Cameroons, situated on the Bay of Biafra, opposite the Spanish island of Fernando Po, has a littoral 320 kilometers long, extending from the Rio del Rey estuary, 4.30° north latitude, to the River Campo, 2.14° north latitude. It can best be described as an irregular, pear-shaped territory, abutting, for a short distance on the north, on the south shore of Lake Chad.

The Cameroons colony may be divided into four parts: (1) The coast region, a land of primeval forests, a fruitful and rich soil, but moist, and, for Europeans, unhealthy; it is practically to this littoral that the German undertakings are, as yet, confined. (2) Adamaua, a high-lying, grassy, thickly populated table-land, where the temperature is cooler and the climate much healthier than on the coast. (3) The practically unexplored Hinterland, forming the basins of the upper Nyong and upper Ngoko, in the southeast of the colony. (4) The country which may be described as the Cis Shari Bagirmi, the district lying to the south of Lake Chad, joined to the rest of the Cameroons by a narrow neck of land, variously estimated at from 60 to 105 kilometers in width. The future prosperity of the colony depends on the developments of Adamaua, along the courses of the Rivers Nyong, Sanaga, and Mbam, an important feeder of the Sanaga. Factories have been built on the Sanaga as far up as the Edea Falls. Three days' marching upstream brings the traveler to the Herbert Falls. The Sanaga River has never been explored by Europeans above the Nachtigal Falls, about 12.30° east longitude, a curious neglect of what should be the great waterway into the interior. It is said by the natives to be navigable for a considerable distance above the falls.

In 1882, before the establishment of the German colony, the Hamburg firm of Woermann, which has since then been so closely connected with German colonial enterprises, established a steam service between Hamburg and west Africa, making the journey from Hamburg as

quickly as the British steamers from Liverpool. In 1885 the imperial post-office arranged with the Messrs. Woermann to take charge of the mails for west Africa, the firm receiving in return the ordinary international postal sea-transit charges, and the right to call their vessels "postal steamers." In 1887 the imperial post-office established a regular postal agency at Cameroons, which, during its first year's work, received 6,930 and dispatched 4,200 letters, etc. (including 30 parcels). In 1891 30,000 letters, papers, etc., passed through the Cameroons post-office, among which were 430 postal orders, amounting to a total of £3,750, and 700 parcels. On the incorporation of Ambas Bay in the colony, a postal agency was opened at Victoria, for the use of the factories on the coast from Rio del Rey to Bimbia, and of the various missions. The postmaster in Cameroons receives £375 a year salary from the imperial post-office. Additional postal agencies were established at Bibundi in 1891 and at Gross Batonga, the chief trade center in the southern district, in 1893.

The Cameroons post-offices, besides making use of the Woermann steamers, which call once a month at Cameroons, Victoria, and Bibundi, receive and forward mails by the British and African Steamship Company, and by the African Steamship Company, which call at Cameroons every three weeks. Letters forwarded by the German Company direct to Hamburg reach Berlin in twenty-four days; by the English steamers in thirty days. In the local colonial service, letters are forwarded not only by the Woermann steamers but by the Government boats, German merchantmen, and any other available means of communication.

The Cameroons telegraph station was opened in February, 1893. The cable from Cameroons, 337 kilometers long, is laid to Bonny, in the Niger Delta, where there is a station of the African Direct Telegraph Company; thence the communication is over the English line, via Brass, Lagos, Acra, Sierra Leone, and Bathurst to St. Vincent and England.

NAVIGATION.

During the year ending July 31, 1893, 64 ships of a total tonnage of 127,868, arrived in the colony, exclusive of the ships of the imperial navy. Of these 38 were English and 26 German. In recording this division of trade, the official memorandum adds, "the German steamers have lately run the British steamers in the Rio del Rey district very close."

The only means of transport in the colony, excepting, of course, the ocean steamers which touch at the ports, are nine small steamers, boats, and canoes. On shore everything has to be carried by porters, as there are as yet no beasts of burden available for the transport service. Since the Rio del Rey has been explored the ocean steamers regularly call there.

In the Kribi district, the Elea Falls of the River Lokundje have been passed, and the river explored in boats as high as Bipindi.

The Njong River has been navigated by small steamers as far as the Mount Falls.

In the Victoria district the roads to Bimbia, Bota, Busumba, and Bonyongo have all been repaired and a new road to Buea begun.

GERMAN SOUTHWEST AFRICA.

German Southwest Africa is bounded on the south by the Orange River; on the east, the twentieth degree of longitude to latitude 22° south; and north of that intersection the twenty-first degree of longitude forms the frontier, with a long tongue of land in the northeast corner, giving the colony access to the Zambesi above the Victoria Falls; on the north, the River Cunene to the great cataracts; thence the degree of latitude to the River Cubango; that river to Andara, and thence a line to the Katima Rapids on the Zambesi, forms the frontier; on the west, the Atlantic Ocean.

The German Colonial Society have established direct steam communication between Hamburg and the mouth of the Swakop, or Walvish Bay; but considerable difficult has been encountered at the former place in landing goods by means of surf boats. On November 20 next, the fourth steamer dispatched this year direct to German Southwest Africa is advertised to leave Hamburg, the passage taking about a month. It is reported that means will be taken to improve the landing place as soon as funds permit; if possible, during the course of next year.

There is also a regular steam communication, once every four weeks, between Cape Colony and its dependency Walvish Bay. Messengers of the German West Africa Company carry the mails to and from Windhoek, Otjimbingue, and Tsaobis, in connection with the Cape-Walvish Bay service.

GERMAN EAST AFRICA.

The frontiers of German East Africa, the creation of Dr. Carl Peters, were defined by the Anglo-German agreement of July 1, 1890. This large tract of country, 955,220 square kilometers in extent, is bounded on the north by British East Africa and Lake Victoria Nyanza; on the west, by Lakes Tanganyika and Nyassa and the Stephenson road; on the south, by the River Rovuma, and on the east by the Indian Ocean, with a coast line of about 360 miles.

As the result of the negotiations which have long been pending between Germany and Portugal as to the frontier of their respective spheres of interest near Cape Delgado, it was decided last month that the line of 10° 40′ south latitude should form the frontier from the coast till it strikes the River Rovuma, so that both banks of that river's estuary and Kongo Bay remain German territory, and the colony's

limits are extended on the coast as far as Cape Delgado, all the territory in dispute to the south of 10° 40′ falling to Portugal.

TRANSPORTATION, POSTAL SERVICE, TELEGRAPHS, ETC.

Direct communication between Germany and the colony is maintained by the German East African Mail steamers; besides the steamers on the main line—Hamburg, Zanzibar, Natal—which call at Tanga, Dar es Salaam, and Lundi, the company have undertaken a subsidiary service along the coast from Lamu in the north to Inhambane in the south, calling at all the ports on the intermediate coast. East African mails are also received and dispatched by the British East Indian Steam Navigation Company and by the French Messageries and the Portuguese Royal Mail. Mails are also forwarded to and from Zanzibar twice a week in dhows, and there is a daily land post between Bagamoyo and the capital, Dar es Salaam, the postmen receiving for the journey there and back, 150 kilometers 3 rupees (4s. 6d.). The head postmaster at Dar es Salaam receives £500 a year from the imperial post-office; seven postal clerks in the colony receive £300 a year each.

In 1892 a monthly postal service was organized between Dar es Salaam and Lake Victoria Nyanza, the native postmen performing the journey within fifty days. They wear tokens indicating their employment, and carry waybills on which the officials at all intermediate stations note the time of arrival and departure.

Telegrams to Germany are forwarded by the Bagamoyo-Zanzibar cable, each word costing 7s. 9d. (7.85 marks). A land line, 184 kilometers long, connects Bagamoyo with the northern ports, Sadani, Pangani, and Tanga. The land line is equally serviceable for telegraphic (Morse system) as for telephonic purposes, the rates being the same as in Germany. The native (Suaheli) merchants make frequent use of the telephone, as their language can not be fully represented telegraphically. In 1892, the first year of its employment, no less than 22,723 messages were forwarded.

RAILROADS.

The German East African Railway Company has already completed the first section of the Usambara Railway, which was opened, on the 16th instant, from Tanga to Pongwe, an inland town on the Pangani River, a distance of some 15 kilometers. It is proposed to extend this line eventually to the foot of the Kilimanjaro Mountain, and thence to Speke Bay, on Victoria Nyanza. Many difficulties have been successfully contended with in constructing the line. As originally built, it was not strong enough to withstand the rainy season, the supply of stone running short, as did the supply of dynamite for blasting purposes the quarries being located some 12 to 17 miles from Tanga; and in addition to the 30,000 iron sleepers, 20,000 wooden mangrove sleepers were found necessary as under supports, as without these latter

there was no way of fixing the iron sleepers in the sandy soil. The great part of the wooden sleepers were imported from the British island of Lamu. By the end of this year it is hoped the railway will be open as far as Ngomeny (29 kilometers), and by next summer to Sega, in the fertile Usambara district; it will then be of great use in developing the coffee plantations.

The National Zeitung, in a recent article on the German colonies in Africa, calls attention to the opening of this railway as one of the most important and hopeful signs of German progress in east Africa. European rule in the Dark Continent is bound up with the railway question. So long as the negro is the only means of transport, so long will the Arab slave raider and the slave trade flourish. The construction of railways is the great civilizing means by which this traffic can be got rid of; and no better field for German enterprise can be found than railway building from the coast to Kilimanjaro, and Lakes Victoria Nyanza and Tanganyika. "France, Italy, Belgium, and England," says the writer, "have all recently annexed large tracts of territory by force of arms. Let us show ourselves their equals by undertaking a great work of culture which will do far more for the real civilization of Africa than all their victories."

With reference to the trade of the southern districts, Baron Von Schele, the present governor of German East Africa, states that the only important exports are ivory and india rubber. The English Nyasaland traders have opened a flourishing trade with the Tanganyika and Rikwa lakes districts in the German sphere, "and it is more than ever necessary that we should protect our trade by establishing a customs barrier from Lake Nyassa to the northern end of Lake Tanganyika. These custom-houses would not for the moment bring in much revenue, but the effect they would have in developing our trade toward our own coast would be considerable." His excellency considers that a new post should be established at once at the southern end of Lake Tanganyika, and another near Ujuji, and these could easily be utilized for custom-houses. "If this were done and a steamer provided, the customs control and the political situation would be equally benefited. The launching of the *Hermann von Wissemann* has been of immense benefit to Langenburg Station and to German influence on Lake Nyassa, and the sooner a similar steamer is provided for Tanganyika the better."

It is further proposed to open a direct trade route solely through German territory between Kilwa and Lake Nyassa, and so be independent of the Shire-Zambesi line of communication through the British Nyassaland Protectorate. The governor considers that the lowlands, except along the larger rivers, are of far less commercial importance than the hilly uplands, which form the larger part of the country. "Here lies a treasure for the Fatherland, the value of which can not be overestimated." He believes that the Usambara and Pare highlands, as well as the great central table-land stretching to the lakes, are,

both as to soil and climate, suited for German agricultural immigrants, who could themselves till the land and raise cattle. As to the supply of working hands, Chinese coolies or laborers from some other similar race will be necessary for the present, but his excellency is convinced that by good treatment the natives can be gradually trained to take their place. Humane managers have never any reason to complain of want of labor, "but where the stick rules, the workmen desert, and a body of disciplined and skilled laborers can never be formed."

His excellency strongly urges the construction of roads, and especially of railways, by which means alone the country can be effectively opened up. "I recommend railways the more earnestly because the cost would be little more than that of ordinary roads, if the rails are laid in a cheap and primitive way corresponding to the object in view."

The cotton exported from German East Africa to Germany is reported to be of good quality, equaling that known in the trade as "middling Texas." The price quoted for the best quality is 3½d. per English pound, as compared with 4d. for best Texas cotton. Inferior cottons are also exported, good in quality and staple, but not up to the mark in color.

FREE TRANSIT SYSTEM.

Before leaving German East Africa, there is yet another contrast to which I wish to call attention. By the Berlin act, the free transit system, might, with the consent of the territorial power, be applied on the African littoral extending from latitude 5° north to the Zambesi, thereby establishing a sort of free transit local option, which has apparently yet to become popular on east African coast. Portugal at once declined to have anything to do with it. Germany still retains the original reserves made by the Sultan of Zanzibar before she acquired her part of the mainland. The system is at present applied in the Sultan's possessions between the Rivers Wanga and Juba, including Witu, in the coast line of the English possessions. There is, moreover, no question whatever as to reciprocity between the east Africa neighbors. A German may import goods into British East Africa in transit for German East Africa, and pay no duty whatever at Mombasa or anywhere else until he reaches German territory; whereas, a British trader sending goods through the port of Tanga to a British district in east Africa, would have to pay full import duty at the German port of debarkation.

WEST COAST.

The German colonies on the west coast have already been described in extracts from the report of the British embassy at Berlin, under the heading "German Colonies in Africa."

ANGOLA (PORTUGUESE).

The following information is taken from a report upon the Portuguese Province of Angola, made in 1892 by Commercial Agent Heli Chatelaine, then at Loanda, and published in Consular Reports for December, 1892, No. 147:

POSITION AND AREA.

As defined by the recent treaties with Germany, England, and the Kongo State, the Portuguese Province of Angola is one of the largest territorial divisions on the new map of Africa. Owing to its geographic position, variety of climates, natural resources, and to the progress already accomplished in the civilization of the natives, the intrinsic value and immediate possibilities of Angola surpass those of any other possession in tropical Africa.

From 4° 40′ to 17° 20′ south latitude it has over twelve geographic degrees of sea-coast and the two best harbors of the whole west coast—the mouth of the Kongo River and the Bay of Loanda. Stretching to the interior as far as the Kasai and Zambesi rivers, it forms an irregular quadrangle covering about 1,250,000 square kilometers. In the north and east it borders on the Kongo State, in the southeast on British Zambesi, and in the south on German Southwest Africa.

OCEAN LINES.

The declared exports of Angola amounted in 1890 to a little less than $5,000,000, the imports to about the same sum.

Seven lines of steamers—two Portuguese, one English, one German, one French, one Belgian (to the Kongo), and one Dutch—connect the province with Europe. Though most anxious to have it, the province has no direct communication with the United States.

The principal ports are Kabinda, Kongo, Ambrizette, Ambriz, Loanda, Novo Redondo, Benguella, and Mossamedes.

A line of small steamers plies on the Quanza River, connecting Loanda with Dondo; and the lower courses of the Lifune, Dande, Bengo, and Longa Rivers are accessible to sailing craft. The coasting trade is largely done by sailing vessels.

RAILWAYS.

The railroad from Loanda to the interior is built as far as the Lukala River, and Catombela is connected with Benguella by a small railway. In the south most of the produce is transported from the highland to Mossamedes by the Boers in their ox wagons. Yet well-nigh the whole produce of the interior is still brought down to the coast by the human beast of burden in caravans of native traders, of whom the Mbaka (Ambaca), Ma-hungu, and Kassanji (Cassange), with terminus at Dondo or Loanda, and the Mbalundu (Bailundo) and Viye (Bihe) people, with terminus at Catombela or Benguella, are the most important.

LOANDA.[1]

A spacious harbor, a city on sand and arid cliffs, a dry and sand-logged stretch of maritime plain, two inclosing rivers, and a magnificent hinterland. Such is the heart of Angola, Portugal's most important colony.

---

[1] Extracts from annual report of British consul at Loanda, January 20, 1894.

One does not expect to find much civilization 8° south of the line, on a sweltering African beach; but, nevertheless, within a stone's throw, as it were, of the blazing equator, and the camp fires of Kongo cannibals, St. Paul de Loanda has been a white man's city for upward of three hundred years. It has streets and squares and shops and warehouses, forts and churches and statues. There is a commodious custom-house and a large public workshop, a bank and two railway stations, an observatory, a well-appointed hospital, and an imposing townhall, the latter in course of erection.

There is no finer haven within the circuit of the African continent than Loanda harbor. Formed by a series of scallops in the crumbling cliffs, and a long, low sand bank which breaks the Atlantic swell, it was a gift of nature, abundantly roomy, and as safe as a dock. At one time, vessels could enter on either hand, and run close up to the town; but now the southern pass is practically closed, and the best of the harbor shows ominous patches of silt.

But a port, whatever its merits may be, is merely a gateway, and the city of Loanda is only a tollhouse. Its inhabitants (some 2,000 whites and 14,000 blacks), with comparatively few exceptions, live upon the ebb and flow of traffic with the interior. Undoubtedly, therefore, there must be something in the interior which pays.

The natural highway to this favored land is the River Quanza (one of the two already mentioned as boundaries), which enters the sea about 40 miles south of Loanda Harbor, and is navigated for 160 miles or so, although not without much bumping and scraping and transfer of cargo by two light-draft steamers and an attendant fleet of barges belonging to a local company, as well as by similar vessels owned by private firms.

To the south of the Quanza, there lies an enormous tract of raw, untutored heathendom, where picturesque savages, clothed in little but beads and charms, may be seen lolling in the shade of fronded groves, while the pot of thickening palm oil simmers above the lazy midday fire. This is the Kisama country. Beyond the distillery and the isolated trading stations, at the point where the Quanza ceases to be navigable, as it debouches from a gaping canyon, there stands, in a situation of great natural beauty, the most interesting town in the province. It is not a large place, nor is there anything attractive about its buildings. A broad public square, surrounded by squat-looking shops and warehouses; two or three adjacent streets, of the same indifferent architecture; a few rows of the rubbishy shanties of town-bred people of color, ranged behind under tropical foliage; and the whole within gunshot of the river, where the washerwomen wash and the servants draw water the livelong day—that is Dondo. But Dondo is alive with dusky energy. It is a mart and rendezvous of roaming pagans; a swarming caravansary of benighted tribes. Down the long and winding macadamized road which leads to the town from a great plateau on the east they stream in almost endless succession, and even in single file,

though the highway is wide enough for a dozen abreast, these gangs of untamed adventurers, loaded with African produce and redolent of primeval savagery, but all of them objects of absorbing attention, like denizens of another world. These sturdy fellows, with close-cropped heads and a general appearance of good temper and fearlessness, are Bailundus from the south. Their country is fifteen days' journey away, on the highlands near the sources of the Quanza. From the same distance to the north come these Shingas of the Kwango, lithe and graceful, but not overstrong, and not too honest, either, with their greasy hair in dangling plaits, the skins of leopards and monkeys about their loins, and their nakedness crusted with the dirt of a life-time. And so, from all around they come; Libolos, Kibalas, Bailundus, Masongos, Bangalas, and Shingas; and likewise the demi-semicivilized men of Ambaka, who have a smattering of figures and a reputation for smartness, and who have been known to trade all the way across the continent, from Angola to Mozambique.

Here, then, is the explanation of Angola's prosperity—poured into Dondo by these streaming files of swarthy humanity all the year round, and especially during the earlier months, when the traffic increases to such an extent as to become a source of astonishment even to those who are accustomed to it. The existence of so notable a center of commercial activity, dependent entirely upon the good will of unsubdued tribes, who are as easily excited to alarm as a flight of sea fowl resting on a sand bank, speaks in favor of Portuguese administration. Notwithstanding the old-time slave trade, the natives and the colonists are on the best of terms. Dondo is one of many illustrations of the confidence which exists between them, and of the peaceable effects of being peaceably disposed.

After describing the barter with the natives at Dondo, the report continues:

Next morning they may be seen in their original garb of crusted dirt and adamite aprons, with burdens of from 60 to 90 pounds weight on their shoulders, toiling up the hot and weary road which leads to the table-land and region beyond.

The outgoing loads are of the most varied description. They comprise every article already mentioned as imported, means of barter, and also provisions of wine and other supplies for the traders, Government officials, managers of estates, missionaries, and other Europeans who reside in the neighboring districts. Now and then they include portions of steam engines; machinery for husking coffee and crushing cane; huge cauldrons for purifying wax, and distilling apparatus.

At the summit of the pass there is a wayside hamlet and military station, and a few yards beyond an important bifurcation in the road. One branch—the transcontinental it should be—strikes off in unmacadamized freedom to the east, and, taking the no longer navigable Quanza as a guide, runs out for nearly 150 miles, through a series of

villages, stations, and settlements, to the flourishing town of Malanji—noted for its trade in india rubber—and then, abandoning the river, which here comes up in a bend from the south, pushes on for 100 miles more to the frontier post of Kasanji, where, for upward of twenty years, civilization has tapered off to a colored official accepted on sufferance by the aboriginal Bangalas. In a direct line, this point is almost exactly 350 miles from the city that was founded over three hundred years ago. Beyond it lies an equal extent of unoccupied Angola, including the sources of the Kwango and Kasai; the raided Lunda country; the head waters of the Zambesi, and that fateful streak of delimitation which divides the Portuguese possession from the Congo Independent State. Behind it ebbs and flows the colonial trade; the ebb bringing nothing but useful products, while every advancing wave lands the rum barrel higher. The other branch of the road from Dondo is a continuation of the engineered highway which ascends the pass. Bearing to the north, it sets out across the plateau, but soon begins to bungle at gullies and water courses; and, 30 miles from its starting point, terminates at a collapsed bridge, on the River Lucalla, a tributary of the Quanza.

This highway was intended to connect the port of Dondo with the coffee country, of which the tributary forms the southern fence. Kept in serviceable order it would be an invaluable boon to both planters and traders. Why it is not so maintained is a mystery to the wayfarer, who sees how few repairs are really necessary. With the coffee season beginning, crops plentiful, prices in Europe unusually high, vehicles rotting on their axles, and animals eating their heads off, the situation is sufficiently irritating, no doubt, to mercantile common sense.

* * * * * * *

The garden of Angola is left behind, and before us lie its pasture lands, the wide valleyed acres of Ambaka. This is the home of the wandering native traders who have been mentioned as sometimes crossing the continent to Mozambique. It is an open, fertile, rolling country; is fairly healthy, abounds in cattle, and, with proper management of its numerous streams, would grow anything. In fact, Ambaka might fill the land right down to the sea with endless supplies of wholesome, fresh food.

An idea exists that some such beneficent change will naturally take place as soon as the new railway erects its last station upon one of the bare hillsides of the district. But there is nothing in progress which justifies the hope. Provisions are as dear in Ambaka as they are on the coast, and are likely to remain so a very long time, for two reasons, of which the first is that the natives will not part with their cattle except for slaves. When asked to take money as payment, they reply that they have more of that stuff than they know what to do with. In spite of their trading instinct, therefore, and the faint tincture of

civilization which distinguishes them from their neighbors, it is evident that the development of the country will be delayed for generations if left in their hands. The other reason is the dominant ambition of every white man either to become a merchant or to own a distillery.

Without a doubt, however, the railway to which reference has been made will realize many of the hopes which are fixed upon it. It will not work miracles in human nature, but it will reduce the expense of transporting coffee from the coast from $1\frac{1}{4}$ penny per pound to about one-third penny, provided that the owners of estates and local dealers can find means of getting the produce to the line economically, and will forever keep out of their account books such outstanding items as £7 10s. for the purpose of a barrel of cement worth 14 shillings. Well may they long for the line to be completed. Nearly eight years have elapsed since work on it first began, and the terminus is not expected to be reached before the close of 1895. Dividing the distance by 9 gives an average advance of 125 yards per day, which can not be called a brilliant achievement; but brilliant achievements in Africa generally end in few of the achievers surviving.

The gauge of the line is 1 meter (39.37 inches), and the cost of construction has been at the rate of £4,182 a mile. As to the quality of the work, some people consider that it ought to have been better for the money, and others complain of the material, which is all of Belgian manufacture, as being of very poor quality. But when everything bad has been said that is possible and criticism has exhausted itself, there is still plenty of room for all concerned to rejoice and be thankful. Trains are now running regularly over 162 miles of the total projection of 230 miles, and the first load of coffee was brought down a few weeks ago. Before the next crop is ready for transport Cazengo and Golungo Alto will have the permanent way laid straight between them.

Reckoning the milreis at par, we find that the traffic receipts have increased from £3,445 in 1889 to £11,886 during the first six months of 1893, thus declaring an annual revenue of £23,772 before the line has reached the districts for the carriage of whose produce it was mainly planned. And yet the rates are exceedingly reasonable, both for passengers and goods. The third-class travelers are charged less than 1 penny a mile and the second only three times as much, while a first-class passenger and a ton of coffee are considered equivalents, each being tariffed at 4 pence. For some kinds of goods, such as building materials, the rate is as low as $2\frac{1}{2}$ pence per ton.

In its latest report the company directs the attention of shareholders to the Loanda customs receipts, which have steadily risen year by year, omitting that of the financial crisis in Portugal, from £38,000 in 1886 to over £142,000 in 1893; and by implication, it takes credit to itself for this very gratifying prosperity. Undoubtedly, enterprise encourages enterprise, but the Government income had been on the increase for three years before the railway earned its first £500. It is

not always the horse that moves the cart, even when the horse is an iron one. To say more for the line than can be indorsed by those who see it in operation is neither wise nor necessary. As a speculation it is good enough to stand on its bare merits, and can not fail to reward its promoters if they will only support a continuance of the economy which was begun under the present management. As an improvement to the colony its value is inestimable, and there is no one worthy of the name of either patron or friend who does not sincerely regret that the company is unprovided with means for carrying the work on to the frontier

---

KONGO FREE STATE.

In a report to the Department of State, upon the geography and resources of the Kongo Free State, dated March 21, 1895, Commercial Agent Mohun gives the following particulars as to means of transportation:

The Kongo Free State is divided into twelve districts, as follows: Banana, Boma, Matadi, Cataracts, Stanley Pool, Ubanghi-Ouelle, Aruwimi-Ouelle, Equator, Kassai, Lualaba, Kwango, Oriental, and the Arab Zone, which formerly consisted of the districts of Stanley Falls and the administrative region of the Tantanika.

MEANS OF REACHING THE KONGO FREE STATE.

The most direct route is by the steamers leaving Antwerp the 6th of every month and arriving at Boma in twenty-four days. The agents are John P. Best & Co., and Walford & Co., Antwerp.

The other lines are the Afrikanische Dampschiffs-Linie (A. G. Woermann Line), which sends steamers from Hamburg, Germany, every week, stopping at all points on the north and west African coasts, making the passage to Boma in forty to forty-five days.

The Afrikaansche Handels-Vennootschap (commonly known as the A. H. V., or Dutch House), of Rotterdam, which has its own steamers, leaving every three weeks for Banana which is reached in twenty-two days.

The Portuguese Royal Mail Line to San Antonio, opposite Banana, leaves Lisbon every week—twenty-two days to San Antonio.

The Chargeurs Réunis, or French Line, from Hâvre, and another French line from Marseilles—twenty-four days to Boma.

The African Steamship Company and British and African Steam Navigation Company, Limited, of Liverpool, send their steamers from Liverpool for north and west African ports every week—forty to forty-five days.

The line from Antwerp goes to Matadi, the other steamers only if they get a sufficient amount of cargo.

The first-cabin fare from Antwerp is $160. The other lines charge the same.

PACKING AND TRANSPORTATION OF LOADS.

The country lying between Matadi (the port for ocean steamers, 80 miles from Banana) and Stanley Pool is very hilly and mountainous, the roads being simply footpaths, and as there are too many rapids in the Kongo River for water transport it is necessary to carry every load on the heads of native porters. To do this successfully requires great care in baling and packing. The bales must not be over 4½ feet long and 20 inches deep, or weigh over 78 pounds; boxes same length and weight. Of course, some pieces of machinery are over this weight, which necessitates two porters to one load. In Europe every bale is first wrapped in waterproof cloth and then baled with bagging stuff and fastened with four iron straps. All boxes containing destructible articles or such things as are destroyed by water are first placed in a zinc box and soldered tight, then in a strong wooden box securely screwed, few, if any, nails being used. Upon the arrival of goods from Europe they are immediately placed in a warehouse to await porters for transport, who are recruited by white agents at Matadi, Issanghila, Lukungu, Manyanga, Luvitiku, also at Kinchassa or Leopoldville, on Stanley Pool. The porters are sent to Matadi from some one of these stations with the ivory and rubber which have arrived from Stanley Pool, and then immediately sent up country with loads of merchandise.

For carrying one load they receive pay as follows:

From Matadi to Lukungu:	
Pay, 4 pieces handkerchief, at 40 cents	$1.60
Ration, one-half piece handkerchief, at 40 cents	.20
	1.80
From Lukungu to Leopoldville, Stanley Pool:	
Pay, 1½ pieces handkerchief, at 40 cents	.60
Ration to Leopoldville and return to Lukungu, 2 pieces handkerchief, at 40 cents	.80
	1.40

For each caravan of 12 men, the headman receives as follows:

From Matadi to Lukungu:	
At Matadi—	
Pay, 6 pieces of handkerchief	$2.40
1 hat	.50
1 parasol	.50
Ration, 1 piece handkerchief	.40
At Lukungu—	
Ration (to return), 2 pieces handkerchief	1.20
Pay, 3 pieces handkerchief	1.20
1 parasol	.50
1 hat	.50
Ration, 2 pieces handkerchief	.80
At Leopoldville—	
Ration (to return), 2 pieces handkerchief	.80
Total	9.40

This gives an additional sum of 78 cents to be added to the cost of each load, bringing the total to $3.98 actual cost per load of 78 pounds' weight from Matadi to Leopoldville. But to this must be added the cost of keeping up the transport stations, seven in number, which would be about as follows, per annum:

2 white officers, pay $800	$1,600
Food	600
Medicines, house building, repairs	200
Voyage from Europe	350
2 negro clerks, pay and food	300
40 native laborers, pay and food	3,000
Total	6,050

With seven stations, this will amount to $42,350 per annum. Say 80,000 loads go up every year. This will add to the cost 50 cents per load, with 10 per cent additional for insurance, loss, etc.; bringing the actual cost per load to $4.90.

On arrival at Stanley Pool, the loads are placed in warehouses, and when steamers arrive they are sent to the different factories. These loads consist of cloth, beads, food, brass rods (in rolls), guns and powder, parts of steamers and machinery of all sorts, zinc roofing, chains, etc.

MEANS OF TRANSPORT ON THE UPPER KONGO.

There are on the upper Kongo to-day the following steamers: *Ville d'Anvers*, *Ville de Bruxelles*, *Ville de Bruges*, *Stanley*, and *Deliverance*, all stern-wheelers, and capable of transporting from 40 to 50 tons each. They also have accommodations for six to eight cabin passengers, and can carry on their lower decks, when half loaded, from 250 to 300 soldiers. These steamers do all the State transportation.

The following are attached to the different stations as "stationaires:" *Ville de Charleroi*, Equator station; *Ville de Gand*, Bangala station; *Ville de Verviers* and *En Avant*, Ubaghi station; *Ville d'Ostende*, Lusamblo station; *Ville de Liège*, Arab Zone; in all, twelve steamers.

The French Government has the following steamers at Brazzaville, Stanley Pool: *Ubaghi*, *Aliema*, *Djoue*, *Faidherbe*, and *Amiral Courbet*.

Mission steamers.—*Peace* and *Good Will*, Baptist Missionary Society of London; *Henry Reed*, American Baptist Missionary Union of Boston, Mass.; *Pioneer*, Kongo Baolo Mission of London; *Notre Dame du Perpétuel Secours*, Belgian Catholic Mission of Bruxelles, and *Leo XIII*, French Catholic Mission.

Société Anonyme Belge.—*Florida*, *Archiduchesse*, *Stéphanie*, *Princesse Clémentine*, *Roi des Belges;* all stern-wheelers and capable of transporting from 40 to 50 tons each. *Auguste Baernaert*, *Baron Lambermont*, *General Sanford*, *La France*, *Ville de Paris*, *Seiout*, *Rhône*, *Seine*, *Dumas*, and *Katanga*, smaller boats, but very useful in going into the Kongo tributaries; in all, fourteen steamers.

Dutch House.—Frederic, Holland, Princess Wilhelmina, and *Antoinette*, all stern-wheelers.

In addition to this fleet, the State and trading houses possess many iron whaleboats, cutters, and sailing launches, and also vast numbers of large dugout canoes, which are very useful. All these steamers have a white captain and engineer on board, but their crews are made up entirely of Bangala natives, who have taken to this work very readily and have proven themselves to be the sailors of interior Africa.

August 22, 1892, I left Boma for Matadi on board the State steamer *Prince Baudain* to make arrangements to go to the upper Kongo. Just above Boma the river becomes quite narrow and very deep, and it runs between high hills. At Underhill, below Matadi, the river makes a sharp turn, which makes this point very dangerous. Steamers from Europe pass at least once a week, and so far no accident has occurred, although the whirlpools and countercurrents are very strong.

KONGO RAILWAY.

At Matadi, which is at the head of navigation, is located the main office of the Compagnie Chemin de Fer du Kongo (Kongo Railway Company), this being the point of departure of the line to Stanley Pool. I made one or two trips over the line and found that the work was being done in the best manner and that it reflected great credit on the engineers and workmen, who have had enormous difficulties in their way. It is progressing very slowly, as labor is hard to procure. Natives are now beginning to offer themselves, so it is reasonable to suppose that greater progress will be made now than heretofore. Mr. Hector Charmanne, chief engineer at the time, showed me many courtesies. He made the preliminary surveys, and did the hardest work, but was superseded in 1893 by a French engineer, an ex official of the Panama Canal Company.

The line is now open to Kenge Lemba, at kilometer 40 (twenty-fifth mile), and here reaches an altitude of 780 feet. For some miles beyond this the right of way has been cut and the bed prepared to lay rails. The engineering work presents enormous difficulties, as the road lies through a mountainous country, and in view of this, taken with the fact that the climate is exceedingly bad, one can not help being surprised at the rapid and thorough work which has been and is being done.

All material comes from Belgium, but many canned provisions and much salt beef and pork come from the United States. I think that if an agent who could speak French were sent from some of our numerous manufactories of railroad devices he would be able to sell labor-saving machinery, especially that for cutting and digging.

The amount paid engineers, mechanics, clerks, etc., is small and would hardly induce our skilled artisans to apply for work. The ordinary black laborer, from the English settlements on the west coast of

Africa, receives from $5 to $15 per month and rations. They are housed and well cared for, have the best food and medical attendance possible, and do no work on Sunday. From what I have seen, I think the company treats its employees with great kindness and consideration. There has been no serious labor trouble so far. The men are well paid and no ill treatment at the hands of white employees is allowed, all questions as to punishment being decided in the courts of the State.

I give below the proposed tariff for passengers and freight when the railway is completed:

Description.	Francs.	Equivalent in United States money.
Passengers.		
Between Matadi and Ndolo, on Stanley Pool, either way:		
First class	500	$96.50
Second class	50	9.65
Merchandise per 100 kilos (220.46 pounds).		
From Matadi to Ndolo, all merchandise	100	19.30
From Ndolo to Matadi:		
Palm-nut clusters, peanuts, and wood for building purposes	10	1.93
Coffee	28	5.40
Rubber	43	8.30
Copal-white	18	3.47
Copal-red	32	6.18
Palm oil	12	2.32
Ivory	100	19.30
Sesame	10	1.93
Tobacco	27	5.21

THE LOWER KONGO.

The Kongo is navigable for steamers drawing 19 feet, in the dry season, as far as Matadi, which is at the head waters of navigation. In the wet season any draft can be carried, but passing Hells Kitchen, which is a very sharp bend in the river below Matadi, navigation is extremely difficult, as there are numerous heavy whirlpools and the current comes down at the rate of 8 knots. Large steamers have taken as long as two hours to make 200 or 250 feet to get around this bend when the river is high in December. There is no particular danger, as the State has a full corps of competent pilots who know the river thoroughly. At this place the river is about half a mile wide, at Boma 4 miles, and at Banana 16 miles. At Banana there is an excellent harbor in the river capable of taking 27 feet draft. Ships' stores, including coal, can be purchased here from the Dutch House, and a hotel belonging to the Compagnie Magasins Généraux, of Brussels and Boma, affords excellent accommodations for travelers.

At Boma there are two piers some 120 feet in length, one belonging to the State and the other to the Compagnie Magasins Généraux, which afford excellent berths to the ocean steamers arriving.

TRANSPORTATION CHARGES.

Charges for transport on the upper Kongo on steamers belonging to the State, per 1,000 kilograms (2,204.6 pounds), are as follows:

Description.	Francs.	Equivalent in United States money.
For merchandise from Stanley Pool to Boumba (near Itimbiri River)	300	$57.90
From Stanley Pool, above Boumba, to Stanley Falls	400	77.20
From Stanley Pool to stations in the Oubanghi below the rapids of Zongo	350	67.55
From Stanley Pool to the Kassai and its affluents	300	57.90
For merchandise sent from an interior station, accessible by steamer, to Stanley Pool:		
Ivory	500	96.50
Rubber and other native products	200	38.60
All other merchandise	150	28.95

Charges for passenger transport on steamers belonging to the State.

UP RIVER.

From Leopoldville, Stanley Pool, to—	Whites.		Blacks.	
	Francs.	Equivalent in United States money.	Francs.	Equivalent in United States money.
Kwamouth	30	$5.79	7.50	$1.45
Bolobo	50	9.65	12.50	2.41
Lukolela	75	14.48	20	3.86
Equator	100	19.30	25	4.83
Bangala	125	24.13	30	5.79
Upoto and Boumba	175	33.78	45	8.69
Basoko	200	38.60	50	9.65
Stanley Falls	225	43.40	60	11.58
Luebo (Kassai)	200	38.60	50	9.65
Lusambo (Seukuru and Hassai)	200	38.60	50	9.65
Zongo (Oubanghi)	200	38.60	50	9.65

DOWN RIVER.

From Stanley Falls to—	Whites.		Blacks.	
	Francs.	Equivalent in United States money.	Francs.	Equivalent in United States money.
Basoko	12.50	$2.41	3.50	$0.61
Boumba and Upoto	40	7.72	10	1.93
Bangala	50	9.65	12.50	2.41
Equator	60	11.58	15	2.90
Lukolela	75	14.48	17.50	3.38
Balobo	85	16.40	22.50	4.34
Kwamouth	100	19.30	25	4.83
Leopoldville	110	21.23	30	5.79
Luebo, Lusambo, and Zongo to Leopoldville	100	19.30	25	4.83

NOTE.—Meals and cabins are not included in the above; for the former 15 francs ($2.90) and for the latter 5 francs (96.5 cents) per diem is the usual charge. Each passenger is allowed 60 kilograms of baggage.

LIBERIA.

Consul-General Lewis, of Sierra Leone, in a report to the Department of State, November 6, 1885 (printed in Consular Reports, June, 1886, p. 176), gave the following description of Liberia and adjacent territories:

The traveler, sailing from the north along the west coast of Africa, meets first the French colony of Senegal. Here he will witness a degree of political, industrial, and commercial activity which, perhaps, justifies the appellation of "Little France" given to this colony. Railways have been constructed along the coast, and are being extended toward the interior. Telegraphic communication is being established between the coast and interior settlements. About 100 miles lower down the traveler will reach the settlement of Goree, on an island about 4 miles from the mainland. On the mainland directly opposite is situated the comparatively recent and growing settlement of Dakar. Telegraphic and railroad communication exists between Dakar and Senegal. From these three settlements the French are endeavoring to penetrate to the interior, commercially, by the construction of roads and by military enterprises.

Below Goree and Dakar is the British settlement of Bathurst, on the Gambia River, which formerly yielded considerable trade; but, owing to neighboring wars, the trade has fallen off, and what little there is now is largely in French hands. Between the Gambia and Sierra Leone, along about 400 miles of coast and a strip of maritime territory claimed by the Portuguese, are three small French trading settlements established at Rio Nunez, Rio Pangas, and Meelacouri. At the mouth of a small river, called Dubreka, between Meelacourie and Rio Pongo, claimed by the French, the Germans have recently raised their flag in spite of French protestations.

Two hundred miles below Sierra Leone, at the Manna River, begins the Republic of Liberia, extending about 400 miles along the coast to the San Pedro River. This country is, I believe, considered by those who claim to know, the most fertile and productive of all west African countries. Liberia is an interesting instance of American benevolence and foresight. Founded by a philanthropic society having its headquarters at Washington, it has, with its slender resources, accomplished a great work for this part of Africa, and seems to present an inviting field for enterprising black men from America. Many of the people have emigrated from the United States and are more favorable to the extension of American influence in the country than of any other.

From all accounts which I have been able to gather from many people, Liberia is rich in natural resources, and with a slight change in governmental restriction, and with the application of capital, would be unsurpassed in productiveness. In mineral and agricultural capacity it is thought to be without a rival in this part of Africa.

Among its products are palm oil, palm kernels, ground nuts, cocoanuts, cola nuts, camwood, barwood, indigo and other dyes of different colors, red, yellow, and brown; beeswax, india rubber, gum copal, cotton, ivory, rice, indian corn, yams, cassada, sweet potatoes, oranges, lemons, limes, plantains, bananas, guavas, pineapples, papaw, mango, plums, alligator pears, breadfruit, tamarinds, coffee, sugar cane, cocoa, arrowroot, bullocks, sheep, hogs, goats, fowls, etc.

The country seems peculiarly adapted to the successful raising of coffee, and this Liberian coffee has within the last few years acquired, I believe, a reputation very high. The immigrants from the United States, especially in recent years, have been devoting more attention to its cultivation. They are pushing their settlements toward the interior and enlarging their farms.

I have no means at hand for giving a correct statement of the exports and imports of the Republic, but I believe them considerable, and the country easily capable of doubling the present output.

German and English steamers stop every week at some of the Liberian ports, and there are large Dutch establishments.

* * * * * * *

SIERRA LEONE (BRITISH).

In a report to the Department by Consul Bowser, December 29, 1890, printed in Special Consular Reports, "Streets and Highways," page 540, it is stated that the streets in the colony and city are all alike. "There is an underlying bed of soft, calcareous rock, with various depths of earth, from 3 to 5 feet. The roads are made by digging trenches on each side, and throwing the dirt to the center and leveling; then a top dressing of broken stone completes the street or road. As there are but two horses and one dogcart in the colony the roads are easily kept in repair, when only naked feet tread them. The roads that lead far into the country are nothing more than narrow paths, and all travelers go single file. The cost of maintaining the roads here is in the filling up of some ruts that may be caused by washouts during the rainy season. One can readily see that road and street making are of little expense in this country."

In a subsequent report, dated August 22, 1893, and printed in Consular Reports for January, 1894, page 218, Consul Bowser says:

> Goods reach this district direct by sailing ships and by steam vessels via England. They are landed by lighters at wharves and jetties, the ship being moored near by. Warehouses and sheds are provided by the Imperial Government at nominal charges after five days' storage. Goods for the interior traffic are all carried on men's heads and shoulders, in parcels weighing from 60 to 100 pounds. Some goods are carried many miles into the interior. Dry goods in bales well hooped and waterproof lined will suit the present mode of conveyance.

Consul Pooley, in a report dated June 30, 1894, and printed in Consular Reports for October, 1894, pages 238–245, says:

> A chamber of commerce was established in Freetown in 1893, and the British Bank of West Africa during the present year. The rate of exchange varies from 1 to 2½ per cent for bills drawn on England. There is also a Government post-office, savings bank, and the post-office money-order system.
>
> There is a weekly and semimonthly mail running between Liverpool and west Africa. All the steamers call at Sierra Leone outward and homeward. In addition to these, there are occasional opportunities for homeward mails via Hamburg and Havre by British vessels, and via Havre and Marseilles by the steamers of two French lines. The rate of postage is 5 cents per half ounce to all parts of the world.
>
> * * * * * * *
>
> It is hoped that when the frontier line has been correctly and satisfactorily defined, increased traffic from and to the hinterland will result. It will, however, take no little time to restore confidence and reassure the natives. But perhaps the prospect is a little more cheering to both races now that, at the instance of the Liverpool Chamber of Commerce, the country has been surveyed by a Government official for a light railway from Freetown. Its commencement is looked forward to with much interest by the entire mercantile community of Sierra Leone.
>
> * * * * * * *

It has been for some time in contemplation to construct a dock for the better accommodation of steamers; but neither this, nor the projected railway, nor even the promised municipality, is likely to mature during the present century.

No records are kept nor tables compiled of the tides, and the only information obtainable is that when it is high water at London Bridge the opposite obtains here.

PROPOSED RAILROAD.

A copy of the Weekly News, of Freetown, Sierra Leone, May 18, 1895, transmitted to the Department by Consul Pooley, contains a report of an address by the governor of the colony before the legislative council, in which he urged the construction of a railroad to develop the resources of the country. The following extracts are taken from the address:

The main trade routes through the protectorate are:

(1) From Falaba by Bafodeya or Bumban, thence to Port Lokko.

(2) From Matatoka, tapping the Kuniki and the Sanda Lokko countries (the latter in the region of Karriyemma), thence by road to Benkia, on the Rokelle, where the produce is loaded in small canoes and transported to Magbilleh, and thence transshipped in larger ones to Freetown.

(3) From Mongheri through Senahu to Freetown.

(4) From the Upper Mendi districts to Mafweh, Pujehun, and Bandasuma, respectively, thence by waterways to Bonthe, Lavana, Sulima, and Mano Salija.

As to the produce conveyed along these routes:

By the first route, small quantities of ivory and gold from the interior; rubber from the interior, but also from Kuranko; cattle in considerable numbers, cola nuts, small quantities of palm kernels and oil, and rice, chiefly from the districts around Port Lokko.

By the second route, palm kernels, rubber, benniseed, cola nuts, rice, etc.

By the third route, rubber and cola nuts, a little ivory, and a small quantity of palm kernels.

By the fourth route, rubber, small quantities of cola nuts and ivory and large amounts of palm kernels and oil.

Turning to the nature and fertility of the country, I think there is no doubt that the southern portion of the protectorate, which may be divided, roughly speaking, from the northern by an east and west line drawn through Port Lokko is by far the most fertile and productive. In the northern portion, the country lying to the west of the range of the Warra Warra Limba mountains, which extend from Bafodeya to Bumban, is, generally speaking, open grass land with "scrub," well adapted for grazing cattle, but the soil is either light and sandy or mixed with gravelly laterite, and in some parts so little productive as not to be able to raise sufficient rice, which is their staple food, for the inhabitants. To the east of the range, as far as our frontier, the country is richer, especially between Sininkoro and Karriyemma, where it is under forests for the most part, in which the rubber vine abounds, but the valley of the upper waters of the Bagweh, Bagru, and Sehli rivers, which comprehend the Iraiya district, are not productive and are only very sparsely inhabited, and there is a broad belt varying from 20 to 40 miles running along the watershed which forms our northeastern frontier, which was swept bare by the Sofas within the last few years and is reported to be quite uninhabited.

There are no palm trees to the east of the Warra Warra Limba range, and these trees are very scarce to the west of it, and the only district where they grow in very productive quantity is about Massumbu, where they were noticed by Mr. Bradford during his survey of the line to Bumban.

On the other hand, the southern portion may be said to be throughout rich and productive, especially in oil-bearing palms; the districts about Sherbro and all along the coast are famous for the amounts of oil and kernels which they yield. In some parts of the Bargru district, along the coast, the natives even complain that they are so numerous as to impoverish the land and that they can not in consequence grow rice, but these rich products are not alone confined to the lower districts. The Upper Mendi districts as far north as a line drawn from Mongheri to Kanre Lahun, and the Sana Konno district to the north of that line, abound in palm trees, but only a small portion of the harvest they yield is gathered, in consequence of the distance from a market and difficulty of transport, and, as one chief informed me during my recent tour, because there are not enough people to pick the nuts. Besides, the forests yield rubber and many valuable woods such as konta and kamwood, which of course can not be utilized owing to the difficulty of transport. In the district lying immediately north of the route from Senahu to Taninahu there are no palms, but at Senahuthere is a rich belt which follows the valley of the Bumpee River.

The principal trade routes which exist from beyond the protectorate are those which enter it across our northern frontier through the French ports at Heimakunu and Wossu. On the eastern frontier between Herimakunu and Kanre Lahun though certain routes cross into our territory, as by Kombili, which is east of Koinadugu, and by Sehamma and thence between the Tinki range and Mount Binsing, practically no trade passes along them owing to the deserted condition of the country bordering both sides of this frontier. From Kanre Lahun, a certain amount of trade is done with the interior at the markets in the Bandeh country, but owing to the chronic state of warfare which exists between Chief Kailundu and the Kissi, Bandeh, and other chiefs, the trade is languishing and intermittent.

Along the frontier on the Liberian side, from Kanre Lahun to the coast at Manoh Salija, there is a constant state of warfare, and the southern half of the border districts is a desert.

During my recent tour there appeared to be a great revival of trade with the interior across our northern frontier, and the number of caravans that have come down is unprecedented; but the future prospects of this trade are very uncertain and its continuance can not be counted on, nor have the products which have come down had such an effect as I had anticipated in relieving the depressed condition of the market. Considering how very sparsely inhabited the regions of the upper Niger appear to be, it is possible that the interior trade from that direction is overrated.

The prospects of any trade with the hinterland of Liberia from Kanre Lahun or elsewhere along the frontier are most remote, owing to the chronic state of warfare which exists all along the Liberian borders.

Turning to the consideration of Mr. Shelford's report, my recent tour has more than convinced me of the desirability of projecting the railway through the upper Mendi districts rather than toward Bumban; that is to say, through the southern portion of the protectorate rather than the northern. It must be admitted that the northern portion is on the whole inhabited by a more sober, industrious, and intelligent people, and a people a large number of whom are born traders; but, on the other hand, the soil is less productive and the trade is more or less dependent on the produce which comes from the interior rather than from the soil itself, and the former is, as I have endeavored to show, an uncertain quantity. Again, such produce as does come down, and which, with the exception of the cattle, consists principally of rubber, gold, and ivory, is not of such a bulky nature as the products of the northern portion, which include palm kernels and oil and timber, and therefore its transport would not be so remunerative to a railway.

With regard to cattle, it is doubtful whether it would be an advantage to transport them by rail. Again, the northern portion is not so capable, I think, of development by means of settlers as the southern; for, though it possesses higher land toward the east and possibly a more salubrious climate than relatively similar parts of the southern portion, the soil is not so productive, as I have already stated.

On the other hand, there is no doubt that the southern portion, especially that part of it lying to the south of the road which passes from Freetown through Mongheri and Pangoma to Kanre Lahun, is extremely rich in palm oil and kernels; its forests contain large quantities of useful and valuable timber and the rubber vine abounds. Moreover, it appears to me that the southern portion offers the best prospects to settlers from Sierra Leone and the West Indies for the cultivation of coffee, cola nuts, etc., and for trade in timber.

For these reasons I would prefer the railway passing through the southern portion rather than the northern.

Turning to the consideration of the exact route which the line would follow, this could only be determined after a survey by a competent engineer; but during my recent tour I carefully observed the country through which I passed, and am of opinion it should follow the route which leads from Songo Town through Manjehun and Mano to Baoma or Koranko. With the exception of the bridging of the larger rivers, such as the Ribbi and Taia, there appear to be no serious engineering difficulties as regards the configuration of the country. From Koranko my route passed over the range of the Kambui hills to Segbwema, a very hilly and difficult country. But I am informed that this range can be turned by a road which passes from Baoma through Wendeh into the valley of the Moa or Sulima river. This valley once gained there would appear to be no great difficulty in carrying the railway as far as Kanre Lahun. The Ribbi River, which is navigable for steamers of the draft of the Colonial steamer *Countess of Derby* some miles higher up than the point at which it would be crossed by the proposed line, would prove of great service for the transport of materials. The above route, while it would not interfere with the cheap and easy means of transport by the waterways through the lower Mendi and Sherbro districts, would tap the resources of the upper Mendi districts, at present quite undeveloped, owing, as I have already stated, to the distance from a market and the expense of transport.

If there is to be a railway at all, whether in the direction of Bumban or through the southern portion of the protectorate, as I would recommend, I think Mr. Shelford's report shows conclusively the desirability of its commencing at Freetown and running for the first section to Songo Town, from which point it can be diverted in any required direction; therefore, supposing there is to be a railway, the first section to be constructed is that between Freetown and Songo Town, and this work need not be dependent on the determination of the direction the line is to take beyond Songo Town.

With regard to the direction in which it will have to be constructed, Mr. Shelford's estimates for the whole of the main line from Freetown to Bumban, a distance of about 140 miles, the net receipts from existing traffic at £8,333 per annum, and taking the interest and sinking fund for the capital required for the light line at 5 per cent, he calculates that the annual deficit on the working of the railway at the outset will be £14,126. But taking into consideration the greater productiveness of the southern portion of the protectorate, I hope if the line be extended through the upper Mendi districts that an increasing traffic would at once be developed and that there would not be such a heavy deficit from the outset. Besides, these districts, and, indeed, the whole of the southern portion of the protectorate, is more populous than the northern, and a certain amount of passenger as well as goods traffic may be anticipated. Whether the aborigines will take freely to railway traveling is impossible to decide offhand, as the experiment has not been tried in the colony, but we may be able to get information as to the extent to which use is made of the Senegal railway by natives, and this information would be some guide in estimating the amount of passenger traffic that may be anticipated for a line in the protectorate.

With respect to the Sulima line, I was never at any time in favor of it, and it was projected before I came to the colony; and, as appears from the letter from the Crown

agents, the prospects of a remunerative return are so remote I think we need not consider the question of its construction. The estimate for the length of this line, which is about 64 miles, is nearly twice as much as for the main line to Bumban, the length of which is about 140 miles; more than twice as long.

With regard to the nature of line and cost of construction: As it is the opinion of experts that a light line of 2 feet 6 inches gauge is the best adapted for the requirements of this colony, I think their recommendations should be accepted, as well as the estimated cost of construction, viz, £133,767, which, together with a landing pier at Freetown, at £15,000, amounts to £148,767, or say £150,000 in round numbers.

SENEGAL (FRENCH).

The French colony of Senegal, according to the Statesman's Year Book for 1895, includes several stations on the Senegal River as far as Matam, with a certain area of land around each, and the coast from the north of Cape Verde to Gambia. These, with the settled portion of Rivières du Sud, embrace over 14,700 square miles, with a population of 174,000, of whom 135,000 are in Senegal. But included in Rivières du Sud and Senegal are various protected states, which give a total area of 54,000 square miles, with a population in 1891 of 1,100,000. There is a governor-general in Senegal, assisted by a colonial council. The chief town of Senegal is St. Louis, with a population of 20,000. Dakar (population, 2,000) is an important center. At high water the Senegal is navigable for small vessels into the interior.

In 1892 there were 246 miles of railway, 574 miles of telegraph line, 1,022 miles of wire, and twenty-one telegraph offices.

Fruits and grains, oils and gums, india rubber, woods, and skins are the chief exports.

The following information is taken from the annual report of the British vice-consul at Dakar, March 15, 1895:

The population of Senegal consists almost exclusively of a tribe named "Yollops," or "Wollops," though natives of the Gambia, Sierra Leone, etc., as well as of the Soudan and Morocco States, are to be met with. The Yollops are engaged almost exclusively in agricultural pursuits, except at the commercial ports, where a gradually increasing number are employed as boatmen, wharf and store laborers, and fishermen; but even men in these employments retire to their villages as soon as the cool weather ceases to cultivate their crops. According to the information at my command, the carrying trade between Senegal and other parts of the world has been performed as follows: Coasting trade and with France and French colonies almost exclusively by vessels bearing the French flag. On the other hand, imported goods have arrived in the colony both in French and foreign vessels (with a slight balance in favor of the latter) from other parts of Europe, etc. The same applies to exports (except to France and French colonies). Among foreign vessels, those under the British flag predominate, coal having been imported almost exclusively in British ships.

MADEIRA (PORTUGUESE).

OCEAN LINES.

Union Steamship Company, Limited.—British; 25 vessels, of 63,352 tons and 63,885 horsepower; leave Southampton for Cape Town on alternate Saturdays. Passenger rates: To London, via Southampton, $61.31; return passage, $124.08; to Cape Town, $173.70. Freight, per ton: To London, general merchandise, $7.37; bananas, $4.86; to Cape Town, $12.16. Time of passage: To Plymouth, three and one-half days; to Cape Town, twelve to fourteen days. First-class return tickets from London to Madeira are issued, from May 15 to August 15, at $76.64.

Castle Mail Packet Company, Limited.—British; 24 steamers, of 41,167 tons and 38,609 horsepower; leave London for Cape Town. Passenger rates: To London, $61.31; return passage, $124.08; to Cape Town, $173.70.

African Steamship Company.—British; 27 steamers, of 43,572 tons and 7,292 horsepower; leave London for west African ports fortnightly. Passenger rates: To Liverpool, $48.66; return passage, $73; to Bonny, $218.97. Freight, per ton: To Liverpool, $3.65; to Bonny, $10.95. Time of passage: To Liverpool, six to seven days; to Bonny, twenty to twenty-two days. These steamers call at the Canary Islands; passage to Canaries, $14.60.

British African Steam Navigation Company.—British; 23 steamers, of 27,241 tons and 5,494 horsepower; leave Liverpool for west African ports fortnightly; all other details same as those given for the African Steamship Company.

Booth Steamship Company.—British; 11 steamers, of 10,708 tons and 1,660 horsepower; leave Liverpool for Para; call at Lisbon once a month. Passenger rates: To Liverpool, $48.66; return tickets, $73; to Para, $97.32. Freight rates, per ton: To Liverpool, $3.65; to Para, $9.73. Time of passage: To Liverpool, seven to eight days; to Para, ten to twelve days.

Mersey Steamship Company, Limited.—British; 5 steamers, of 4,023 tons and 775 horsepower; leave London for the Canary Islands. Passenger rates: To London, $48.66; return tickets, $73; trip round the Canaries and back to Madeira, $29.20 to $38.93. Freight rates, per ton: To London, general merchandise, $4.27; fruit, $3.83; pipe of wine, $5.11; to Canaries, $3.65. Time of passage: To London, five and one-half to six days; round the Canaries, five to eight days. These steamers run regularly every fortnight from November to May round the Canary group, and are the principal carriers of cargo between Madeira and London.

Afrikanische Dampfschiffs-Actien-Gesellschaft (Woermann Line).—German; 13 steamers of 16,500 tons and 2,419 horsepower; leave Hamburg monthly for West African ports. Passenger rates: To Hamburg

$48.66; return tickets, $77.86; to Bonny, $145.98. Freight rates: To Hamburg, $4.86; to Bonny, $10.96. Time of passage: To Hamburg, seven to nine days; to Bonny, twenty to twenty-two days.

Hamburg-südamerikanische Dampfschifffahrts-Gesellschaft.—German; 25 steamers, of 44,413 tons and 8,760 horsepower; leave Hamburg every ten days for Brazil and River Plate. Passenger rates: To Hamburg, $85.28; to River Plate, $97.32. Freight rates, per ton: To Hamburg, $4.86; to Brazil, $8.52. Time of passage: To Hamburg, seven to nine days; to River Plate, eighteen to twenty days.

Empreza Nacional de Navegação.—Portuguese; 9 steamers, of 11,694 tons and 10,100 horsepower; leave Lisbon on the 6th of each month for the southwest coast of Africa. Passenger rates: To Lisbon, $27.70; to Mossamedes, $153.90. Freight rates, per ton: To Lisbon, $4.42; to Mossamedes, $12.96. Time of passage to Lisbon, forty-four to forty-eight hours.

Empreza Insulana de Navegação.—Portuguese; 2 steamers, of 1,918 tons and 360 horsepower; leave Lisbon for the Azores on the 22d of each month, returning to Lisbon about the 5th of each month. Passenger rates: To Lisbon, $25.70; to the Azores, $25.84. Freight to Lisbon or the Azores, $4.10 per ton. This line connects with the North German Lloyd and Portuguese steamers for United States ports at St. Michaels, making it a convenient route for reaching Madeira.

T. C. JONES,
Consul.

FUNCHAL, *June 21, 1894.*

ASIA.

TURKEY.

Two railway lines connect Smyrna with the interior, viz, the Aidin Railway and the Smyrna and Cassaba Railway. Both lines are owned by private companies of foreign capitalists (mainly English), but are under the supervision of the Ottoman Government.

The Aidin Railway extends from Smyrna to Dinair, about 234 miles. The Cassaba Railway runs to Alascheir, about 105 miles. Both lines have one main train track.

The cost of conveyance of goods and the passenger fares depend on the distance. The Smyrna and Cassaba Railway, having recently made a reduction of 50 per cent in passenger fares, has largely increased its income, as the passenger traffic is now three times as large as under the old rates.

OCEAN LINES.

The trade with Europe is carried on in English, French, Italian, Austrian, Russian, German, and Greek bottoms. British steamers carry on the trade between this port and the United States via Liverpool and London, Italian steamers via Naples and Palermo, and Italian and Austrian sailing vessels direct. One or two English steamers run to the United States direct each year during the fruit season.

There are arrivals and departures of steamers to and from the principal ports almost every week.

RIVER AND CANAL TRAFFIC.

The two main rivers of this province are the Meander, in the south, and the Hermus, on the north. Both are navigable only for a short distance. There are no canals, and none are projected.

HIGHWAYS.

The roads are mainly built with earth and broken stone. The only paved roads, with well-built bridges, are those which were constructed by the ancient Greeks and Romans.

J. H. MADDEN,
Consul.

SMYRNA, *July 6, 1894.*

BAGDAD.

Communication between the vilayet of Bagdad (southeastern part of Turkey in Asia) and foreign parts is provided by caravans and by steamers which navigate the Tigris. The caravans are for intercourse with Persia and the interior countries, and the steamers for communication with Europe, America, and India by the way of Bussorah. It will be of interest to give some details regarding the two companies operating the steamers which navigate the Tigris, their origin, their actual condition, and, finally, the profits which the English company has enjoyed ever since its establishment, as worthy the attention of merchants in the United States, and as a possible incentive to the establishment of a line of American steamers.

The English have the right to navigate the Tigris by virtue of a simple vizirial letter by which the Government originally permitted them to navigate the Euphrates only.

In the year 1830, when Bagdad was governed by the late Ali Pasha, the English, who were seeking a shorter route to India, but with no idea of the building of the Suez Canal, turned their attention to the Euphrates and called it their "future way to India." In order to open this route they applied, by advice of Mr. Taylor, then British consul-general at Bagdad, to the British embassy at Constantinople to obtain a firman permitting them to make an expedition upon the Euphrates. The solicited firman having been refused, the English were content with a vizirial letter which authorized them to place four small steamers upon the Euphrates. They forwarded the vessels in sections to Bagdad (via Alexandretta), put them together, and set them on the water. They were called *Tigris*, *Euphrates*, *Syria*, and *Comet*. The first one was wrecked near Ana, but the other three reached Bagdad, passing through the canal of Massoodee, then in good condition, and continued their way to Bussorah.

At that time there was a small vessel, the *Bender Bark*, which carried on the work of the British consulate between Bagdad and Bussorah. That boat was replaced at first by the *Syria*, and then by the *Comet*, which was under command of Captain Yohnes, and afterwards under command of Captain Selby. Since that time there has always been in front of the British consulate-general a little steamer named *Comet*. Toward the end of 1889 the *Comet* was replaced by a similar vessel, which is the third of that name. This vessel was furnished with two mitrailleuses, which give her the appearance of a war steamer.

The *Comet* has a captain and an officer of the English marines, with English assistants (under officers); the crews are East Indian soldiers. The steamer is at the command of the consul-general, who has also twelve kawasses and twenty-four Indian soldiers from a Bengal regiment, who continually mount guard at the door of the consulate at his service.

The English company which navigates the Tigris owes its origin to Capt. T. Lynch, who commanded the four steamers brought from Beregik, upon the Euphrates, to Bagdad, and who had a business house at Bagdad in company with his brother, Stephen Lynch. Assisted by another officer, named Holland, the Lynch brothers undertook to form a navigation company. They addressed themselves to London, where they found subscribers for shares. They also offered some shares to the natives, who, understanding the importance of the enterprise, subscribed liberally.

The company built three steamers called *London*, *Tigris*, and *Blos-Lynch*. The first two having been wrecked, and the third being too small, the company bought the two steamers which are now upon the river, the *Mejidiah* and the *Khalifah*. The company at first encountered serious opposition in the Oman Ottoman Company, which was supported by local authority. The two steamers were obliged during many months to cease taking cargoes, and made trips from Bagdad to Bussorah only for transporting the Indian mails. In the meanwhile Mr. Lynch obtained permission to continue the navigation temporarily, and finally the order was issued from Constantinople under which the steamers of the English company are permitted to ply upon the Tigris.

The Oman Ottoman Company owes its origin to the late Mohammed Rashid Pasha, who brought the two steamers *Bagdad* and *Bussorah* upon the scene during the year 1855.

Namik Pasha, governor general of the vilayet of Bagdad, in the year 1865 procured three other steamers, *Mossoul*, *Phrat*, and *Rassafah*, and Midhat Pasha, who followed him as governor general, increased the number, but he having been called back to Constantinople, the company, from want of proper management, degenerated for some time.

One of the steamers, the *Tellafar*, was burned on the way from Bussorah; others were forced out of the trade, and the company languished in competition with the English corporation until it passed under direction of a functionary of the marine, Amin Bey, who was recently advanced to the grade of pasha for the services which he rendered in the improvement of the condition of the Oman Company. Emin Pasha is now the director.

To-day this company possesses four steamers, the *Bagdad*, the *Mossoul*, the *Phrat*, and the *Rassafah*.

The steamers of the English company, the *Mejidiah* and *Khalifah*, are constructed almost alike. The *Mejidiah* is 216 feet long and 36 feet broad; her engine is 120 horsepower; tonnage, 400, with 4 feet draft when loaded. The *Khalifah* has the same length. Her engine is of the same power and she carries about 50 tons less. The first and second class cabins are the same and in very good condition. The running of these steamers, which carry the Indian mails, is very regular. Every week a steamer leaves Bussorah and Bagdad on fixed days, summer and winter. Each of these steamers takes ordinarily eight or nine days to make the journey.

Passenger rates.

Classification.	From Bussorah to Bagdad.	From Bagdad to Bussorah.
	Piasters.[1]	*Piasters.*[1]
First class (cabin)	200	150
Second class (cabin)	150	100
Third class (deck)	75	65

[1] 1 piaster = $4\frac{4}{10}$ cents United States currency.

First and second class passengers have the privilege of dining with the captain, paying daily 8 rupees (1 rupee = 6 piasters).

The freight for gold and silver is three-eighths of one per cent of value, and the captain being charged with the care of bags of money receives one-fourth of the freight which the company charges.

Although the rates for first and second class passengers are so high, it is noticed that the cabins are nearly always filled with pilgrims who come to visit the shrines of Kerbella and Nejef. The deck is never empty; there are 400 to 500 passengers on an average. Passengers are allowed 30 okes [1] of baggage free, but must pay freight for greater weight.

The Oman Ottoman Company's steamers are very irregular in their trips. On every voyage there is some accident to these old steamers; and were it not for the advantage of the barges trailed with them, they would never pay expenses, which are very small in comparison with those of the English steamers.

The Turkish steamers are all of the same size, 120 feet in length; their engines are of 70 horsepower, and although their passenger rates are more moderate, they have only passengers who are forced to travel upon them. These steamers take twenty days going and coming from Bagdad to Bussorah.

About four years ago the minister of the civil list tried to form a company under the name of Hamidiah, to operate steamers, which was not only to have steamers upon the Tigris as far as Bagdad, but also to render navigable the part of the river from Bagdad to Mossoul, and to restore the navigation of the Euphrates. Rajab Pasha, president of the commission, who directed the affairs of the civil list, also engaged merchants of the country to enter into this enterprise. The English opposed the formation of the company and, after the French engineers sent from Constantinople had studied part of the Tigris, and at the moment when everyone believed the project to be on the point of success, the enterprise fell through, and the English remained sole masters of the river.

The income of the two English steamers *Mejidiah* and *Khalifah*, after deducting the heavy expenses, enables the company to pay a dividend of 15 per cent, besides holding back a good part of the receipts

[1] Oke = 2.85418 pounds.

for a reserve fund. The harbor of Bussorah is much frequented. There are many lines of steamers plying directly between London, Marseilles, and Bussorah, which take, ordinarily, from London to Bussorah, thirty-five days, and from Marseilles, twenty-five days. There are during the exportation season from two to four direct steamers monthly, besides the British India Line, which makes a weekly service between Bussorah and the ports of the gulf and Muskat, Kurrachee, and Bombay. Bussorah has a bright future and its importance increases from year to year.

The journey from Bussorah to Bagdad, in spite of the few villages on the way, is pleasant, and passengers coming from Europe have the advantage of passing through "The Earthly Paradise." This district is very fertile, but the air is rather unhealthy because of marshes in the neighborhood.

Receipts and expenditures of steamers Mejidiah and Khalifah.

RECEIPTS.

Shipments, each voyage:	
Bussorah to Bagdad: 300 tons (234,000 oke[1]), at 5.40 paras[2] (29,250 piasters)	£256
Bagdad to Bussorah: 300 tons (234,000 oke[1]), at 4.40 paras[2] (23,400 piasters)	205
Passengers, each voyage:	
Bagdad to Bussorah	100
Bussorah to Bagdad	200
Passengers and merchandise to intermediate ports	100
Receipts of one round trip	861
Assuming there are 60 voyages yearly the annual receipts would be	51,660

EXPENSES.

Crews, at £267 each monthly, for each steamer	£6,408	
Coal: 60 tons per steamer per round trip, 7,200 tons, at 22s. per ton.	7,920	
Other expenses for two steamers yearly	3,332	
		17,660
Balance		34,000

The freight charges increase sometimes to 10 paras per oke, and the charge of 4 or 5 paras may be considered as the very lowest in use.

It will be seen that the English company makes good profits. If an American company could be formed to work in harmony with the Oman Ottoman Company it would doubtless be repaid. A new company, with two steamers the same size as the *Mejidiah* and *Khalifah*, would probably find subscribers among the natives. Trade with the United States might be built up in a short time in this region, both in exports and imports.

RUDOLPH HÜRNER,
Vice-Consul.

BAGDAD, *April 4, 1895.*

---

[1] 1 oke = 2.85418 pounds.

[2] 1 para = ¼ cent United States currency.

SYRIA.

OCEAN LINES.

Although Syria is not directly connected with the United States by any great ocean line for passengers or freight traffic, there are few sections of the globe of more interest to travelers than the Mediterranean coast, and while tourists from the United States now give special attention to passenger lines on the famous Blue Sea, it is hoped and expected that a better acquaintance and the rapidly growing demands of trade will vastly increase the interchange of commercial products between this country and the United States.

The unprotected condition of the Beirut Harbor in the past, due to the absence of any available docks to be resorted to during stormy seasons, has so far prevented large traffic vessels from touching at this port.

The regular traffic lines that carry passengers, through mails, and freight to and from this city are registered as second-class steamers, and carry the French, Austrian, Russian, or Turkish flag. There are steamers of other nationalities that share in the maritime transactions of this port, but they are more or less irregular and need not therefore be discussed.

Although no great through lines visit Beirut and can be reported upon under the head of ocean lines, still the coastwise lines that touch at this place constitute an important element in the trade of Beirut with foreign countries on the Mediterranean, and especially with other ports along the Syrian coast. It is also expected that the new docks, which are likely to be completed within the course of this year, will give a fresh and powerful impulse to navigation in this part of the Turkish Empire.

Compagnie des Messageries Maritimes Françaises.—The steamers of this company belong to and are controlled by a French association, which receives an annual subsidy from the Government of the French Republic for the regular carrying of public mails. Marseilles constitutes the general terminus of the steamers of this company in their double circuits of the Mediterranean, but their actual termini in the Syrian circular line are Alexandria in the south, with Jaffa and Port Said as intermediate points, and Smyrna in the north, with Tripoli, Latakia, Alexandretta, Mersina, Larnaca, and Samos as main ports touched between Beirut and Smyrna.

The total length of the so-called Syrian line is roughly estimated to be 1,352 miles. The distances between the main points touched by the steamers of said company are approximately as follows:

From—	To—	Miles.	From-	To—	Miles.
Beirut	Tripoli	48	Beirut	Jaffa	120
Tripoli	Latakia	63	Jaffa	Port Said	132
Latakia	Alexandretta	75	Port Said	Alexandria	160
Alexandretta	Mersina	63			
Mersina	Larnaca	136	Total south line		412
Larnica	Smyrna	555			
Total north line		940			

The condition of the company is considered generally good. Its steamers, though of second-class capacity, are the largest and best boats that ply along this coast. They perform postal and traffic service and make regular trips.

The steamers of the Messageries Maritimes which do the service of the Syrian line are five in number, namely:

Steamer.	Tonnage.	Horse-power.	Steamer.	Tonnage.	Horse-power.
Djemnah	3,785	2,900	Senogal	3,716	2,900
Iraouddy	3,785	2,900	La Gironde	3,260	2,900
Niger	3,726	2,900			

These steamers accomplish their itinerary weekly, i. e., every other week one of the steamers touches at Beirut, coming from the north, while another steamer crosses way with her coming from the south.

The rates for first-class passengers from Beirut are:

To—	Fare.	To—	Fare.	To—	Fare.
Jaffa	$6.76	Tripoli	$3.86	Mersina	$17.37
Port Said	12.55	Latakia	7.72	Larnica	23.16
Alexandria	21.23	Alexandretta	12.55	Smyrna	46.32

Freight rates vary considerably in proportion to the distance and kind of goods, ranging generally between 96 cents and $4.83 per ton.

Austrian Lloyds Steam Navigation Company.—This line is controlled by an Austrian company. Trieste is the terminus of the steamers in the Mediterranean, but the Syrian line ends at Alexandria in the south, with Haifa, Jaffa, and Port Said as intermediate ports; and at Constantinople in the north, with Larnica, Limasol, Rhodes, Khios, and Smyrna as intermediate points, besides Alexandretta, Mersina, Mitylene, Dardanelles, and Gallipoli, which are touched by the Syria-Caramania line.

The total distance from Alexandria to Constantinople, by the Syrian line, run by the steamers of this company, is nearly 1,652 miles, and by the Syria-Caramania line about 1,800 miles.

The distances between the main intermediate points will be seen on reference to Messageries Maritimes line of steamers.

The material condition of the steamers of the Austrian Lloyds Navigation Company is not so good as that of the vessels of the Messageries Maritimes Line. The Austrian Lloyds steamers are smaller, and, although they carry mail, passengers, and freight, they are neither so punctual nor so fast. There are no special steamers which do the service of the Syrian line.

The sailings of these steamers are weekly.

The first-class passenger rates, with meals, from Beirut are:

To—	Fare.	To—	Fare.	To—	Fare.
Haifa	$5.79	Limasol	$8.59	Smyrna	$35.13
Jaffa	6.27	Rhodes	23.16	Mitylene	41.02
Port Said	13.03	Khios	30.88	Dardanelles	45.36
Alexandria	20.26	Alexandretta	9.17	Gallipoli	45.84
Larnica	6.28	Mersina	13.17	Constantinople	52.11

The freight rates, as in the case of the French steamers, vary considerably, but the minimum rate is 6 francs ($1.158), and the maximum, 15 francs ($2.89½) per ton, according to the distance and the kinds of merchandise.

Compagnie Russe de Navigation à Vapeur et de Commerce.—This company belongs to a Russian corporation, and it receives a subsidy from the Russian Government for the postal service. Odessa is the terminus of this line of steamers. The Syrian line, however, begins at Alexandria, in the south, with Jaffa and Port Said as intermediate points, and ends at Constantinople, in the north, with Tripoli, Smyrna, Piraeus, Salonica, and Dardanelles as the intermediate ports.

The total length between these two points and the intermediate ports is nearly as already stated. It is worth observing, however, that the steamers of the Russian Company do not touch at Cyprus or Rhodes, nor at any other port of the Caramanian littoral. The condition of the steamers of this company is much like that of those of the Austrian Lloyds Company; but, though small, they are generally preferred by tourists to others, except the boats of the Messageries Maritimes.

The Russian steamers performing the service of the Syrian line are three in number, namely:

Name.	Tons.	Horse-power.
Korniloff	3,800	1,000
Odessa	3,000	960
Lazareff	3,400	800

The steamers of this line call at Beirut weekly.

First-class passenger rates, including meals, from Beirut are:

To—	Fare.	To—	Fare.	To—	Fare.
Jaffa	$4.25	Tripoli	$3.09	Salonica	$46.32
Port Said	11.58	Smyrna	33.58	Dardanelles	51.72
Alexandria	19.30	Piraeus	35.51	Constantinople	54.81

Freight rates range from 6 to 15 francs ($1.158 to $2.89½) per ton, according to distance and kind.

Compagnie des Paquebots Poste Khedivé.—This company belongs to and is controlled by the Government of the Khedive of Egypt. The termini of the trips of the steamers of this company are Alexandria, with Port Said and Jaffa as intermediate ports in the south, and Mersina, with Tripoli and Alexandretta as intermediate ports in the north. The total length of the line is 797 miles, while the distances between the different ports visited by the Khedivial steamers are as shown in the list given under the head of the Messageries Maritimes line. The good condition of the steamers of this company together with their regularity, comfort, and the facilities afforded to trade have made them very popular in Syria. They carry mails, passengers, and freight. Four steamers are doing service in the Syrian line, viz:

Name.	Tons.	Horse-power.
Buheira	1,080	300
Rahmanieh	1,300	200
Faium	1,070	300
Sharkieh	1,160	300

The sailings of these steamers are weekly. The first-class fare is as follows from Beirut:

To—	Fare.	To—	Fare.	To—	Fare.
Jaffa	$6.28	Alexandria	$20.07	Mersina	$15.05
Port Said	15.55	Tripoli	2.90	Alexandretta	15.05

Although Alexandria is nearer to Beirut than Mersina, the fare to the former is higher on account of the fact that these steamers go first to Mersina, then return to Alexandria, which makes the circular line longer. The freight rates on the steamers of this company are about the same as those of other companies.

RAILROADS.

While no railroad is now in operation in Syria, work is progressing on two lines—one from Beirut to Damascus and the Hauran, and the other from Haifa through the Hauran to Damascus. The affairs of the latter are now languishing after the completion of several miles of track and the survey of the entire route, but the work on the line from Beirut to Damascus is being pushed with the energy characteristic of

French engineers and with the ample means commanded by a wealthy corporation of French and Syrian capitalists. The branch of this road from Damascus to the Hauran, 64 miles, is already finished, and will be operated for transporting this year's grain crop from that rich section to Damascus. The main line from Beirut to Damascus is laid in many sections near Beirut, and the grading, leveling, and bridge building are fast approaching completion on the entire 77½ miles. The track will be finished and the line ready for full operation some time during next year.

The tremendous grades over the Lebanon Mountains are such that this great work has been unavoidably delayed, and it is as yet impossible to determine the exact date of final completion, but it is hoped that by the spring or summer of 1895 passengers and freight can be transported over the Lebanon Mountains. The line itself is a narrow gauge or tramway, but the grading is wide enough for the standard roadway, and the ultimate intention is to make it conform and connect with the standard-gauge branch of the same company from Damascus to the Hauran.

The official name of this new railway is "The Ottoman Company of Economical Railroads from Beirut to Damascus," and it has a concession of ninety-nine years from the Sultan. The main line from Beirut to Damascus is 77½ miles and the branch from Damascus to the Hauran (already finished) is 64 miles. Other branch lines to Horus, Hama, Baalbeck, and Aleppo are contemplated, to form in time a part of a grand railway system from Beirut to Bagdad and the Euphrates Valley. The company's capital stock is 10,000,000 francs or $1,930,000, divided into 20,000 shares of 500 francs ($96.50), and the corporation has the power to issue bonds if needed.

It is stipulated in the concession that the work must be completed in four years. It was commenced on December 8, 1892. Interest of 5 per cent is paid to shareholders. Not only is all the iron and material for the road on the ground, but the engines, cars, and general mechanical equipment are already arriving in the port of Beirut. There is only one track on the line, with sidings at termini and stations. No schedule of passenger and freight tariffs has as yet been made out.

HIGHWAYS.

There are no navigable rivers or canals in Syria, but the Damascus road is one of the most famous macadamized highways in the Turkish Empire. It is doubtful if there is a better, smoother, or more beautiful roadway in Europe or America. Constructed by the French after the great massacre of 1860, it has been maintained by a French company ever since as a pleasant highway between Beirut and Damascus, and is an immensely profitable investment. Its total cost was 3,000,000 francs ($579,000), and an annual outlay of $20,000 is made for repair, the road being practically renewed every three years.

It is used for passenger and freight traffic, diligences making two trips daily the year round in thirteen hours, from both Beirut and Damascus, for the convenience of passengers; and carriages and caravans increase the travel and popularity of the highway. From twenty-five to thirty freight wagons a day and many camels and donkeys transport the heavy freight shipments between the two great Syrian cities. The length of this perfectly macadamized highway is 113 kilometers, or $70\frac{5}{8}$ miles, about the same as the railway, which follows the general grade and direction of the roadway. The two lines are practically owned by the same corporation. The condition of this roadway is perfectly maintained at all times, and even in the severest snowstorms the road on the mountain tops is kept free from drifts by the employment of hundreds of men, shovels, and carts. Both the Lebanon and Ante-Lebanon mountains are crossed at a height of fully 5,000 feet, so the immense grading over two mountain ranges in about 70 miles' distance can be easily conceived. This route is historic and picturesque. A branch of this great highway, about 20 miles in length, extends from Chtaura, at the eastern base of the Lebanon Mountains, past the interesting city of Zahleh and alongside the reputed tomb of Noah, to Baalbeck, the most artistic and wonderful of all ancient ruins in this section of the Orient.

The Damascus roadway averages 6 meters (19.7 feet) in width, and for several miles outside of Beirut and Damascus it is well watered in the dry season. The diligence fare for first-class seats is $6.38, and for second-class, $4.44, while private carriages from Beirut to Damascus cost $74.27 for the round trip, which occupies three days. The freight rates from Beirut to Damascus vary between $1.32 and $3.52 per cantar, an Arabic standard of weight equivalent to 560 pounds.

THOMAS R. GIBSON,
Consul.

BEIRUT, *June 1, 1894.*

PALESTINE.

OCEAN LINES.

The only seaport within the province of the Jerusalem consulate is at Jaffa. Eight steam navigation companies have agencies here. The vessels of these companies make regular trips to and from this port. The companies are known as (1) Austrian Lloyds, (2) Messageries Maritimes, (3) Russian Steam Navigation Company, (4) Khedive, (5) Faber, (6) Bell's Asia Minor, (7) Knott's Prince Line, and (8) The Machaussieh. Each of these companies is a private corporation, yet under control of its respective government to the extent of its contracts for carrying the mails, being subsidized for this purpose.

Austrian Lloyds.—The Austrian Lloyds, with headquarters at Trieste, has a fleet of seventy-two screw steamers. Twenty-four of these are modern and have each a capacity of from 2,000 to 4,000 gross tons and from 1,500 to 4,000 horsepower. The other two-thirds of the fleet are old-style vessels, though in good condition and in continual use. Their gross tonnage is from 500 to 1,800 tons each and their horsepower from 300 to 1,400. Some of the larger steamers will accommodate about 100 first-class and 40 second-class passengers.

Besides the Mediterranean, Adriatic, Levant, and Black Sea lines, the Lloyds Company has a service to India, China, Japan, and South America.

The lines in operation on the Mediterranean run weekly steamers from Trieste to Constantinople, Alexandria, Piraeus, Smyrna, Salonica, and Constantinople; and fortnightly to Constantinople, Smyrna, Beirut, Jaffa, Alexandria, and Alexandretta.

Thus, by an Austrian Lloyds steamer, one could ship freight or go as a passenger north or south once a week. A choice of routes going north is given, viz, by the Straight Line, via Cyprus, or the Caramania Line, the former taking six and the latter eight days to reach Constantinople. The points touched by the Straight Line are: Jaffa, Beirut, Larnaca, Limasol, Rhodes, Khios, Smyrna, and Constantinople. The points touched by the Caramania Line are: Jaffa, Kaifa, Beirut, Alexandretta, Mersina, Rhodes, Khios, Smyrna, Mytilene, Dardanelles, Gallipoli, and Constantinople. The Lloyds guide books do not give the distances between these points.

Single first-class passage from Jaffa is as follows: To Constantinople, $63; to Alexandria, $17.40; Trieste, via Alexandria, $78.50; to Trieste, via Smyrna, $120.

The Lloyds Company distinguishes four classes of freight and charges accordingly from Jaffa to Alexandria and Trieste, viz:

Class.	To—		Class.	To—	
	Alexandria.	Trieste.		Alexandria.	Trieste.
	Per ton.	*Per ton.*		*Per ton.*	*Per ton.*
First	$8.40	$21.00	Third	$4.80	$12.00
Second	6.80	16.00	Fourth	2.80	7.00

It must be noted, however, that rates charged by all the coast lines doing business here are liable to great fluctuations under certain conditions.

Messageries Maritimes.—This company has its head offices in Marseilles, and has lines to India, China, Cochin-China, Australia, New Caledonia, East Africa, South America, the Black Sea, and the Mediterranean. It has a fleet of fifty-five screw steamers, two-thirds of which are reckoned as large-sized, having a displacement of from 3,000 to 7,000 tons each, and from 2,000 to 7,000 horsepower. The Messageries steamers touch at Jaffa weekly. Line A leaves Marseilles fort-

nightly, going via Piraeus, Salonica, Smyrna, Samos, Larnaca, Mersina, Alexandretta, Latakai, Tripoli, Beirut, Jaffa, Port Said, Alexandria, and Marseilles. Line B leaves Marseilles fortnightly, going via Alexandria, Port Said, Jaffa, Beirut, Tripoli, Lataki, Alexandretta, Mersina, Samos, Smyrna, Salonica, Piraeus, and Marseilles.

The Messageries Maritimes Company is the only company that seems to have calculated the distances between its ports. According to its guide books, the distance from Marseilles to Egypt, Syria, and return is 4,300 miles. Passenger and freight rates are as follows:

From Jaffa to—	Distance.	First-class passengers.	Freight (per ton).		
			First class.	Second class.	Third class.
	Miles.				
Alexandria	392	$16.00	$5.00	$4.00	$3.00
Marseilles	.....	.....	20.00	12.00	8.00
Via Alexandria	1,700	74.00	.....	.....	.....
Via Piraeus	2,600	103.00	.....	.....	.....

Rates, owing to severe competition, are sometimes reduced to 50 per cent of the above figures.

The steamers of this company are renowned for punctuality, neatness, and general good treatment of passengers.

Russian Company.—The Russian Steam Navigation and Commerce Company has its headquarters in St. Petersburg. It has a fleet of thirty-six screw steamers, varying in size from 200 tons and 300 horsepower to 7,000 tons and 3,400 horsepower. The average passenger capacity of these steamers is 40 first-class and 30 second-class berths. They visit Jaffa once a week, on fortnightly round voyages. The points touched are Odessa, Constantinople, Dardanelles, Mount Athos, Salonica, Piraeus, Khios, Smyrna, Tripoli, Beirut, Jaffa, Port Said, and Alexandria. On the return trip, they make these same ports in reverse order.

Freight and first-class passenger rates are as follows:

From Jaffa to—	First-class passengers.	Freight (per ton).		
		First class.	Second class.	Third class.
Alexandria	$13.60	$5.00	$3.60	$2.50
Odessa	.....	13.00	10.00	8.00
Via Alexandria	81.60	.....	.....	.....
Via Smyrna	112.00	.....	.....	.....

Reductions on these rates are to be obtained at certain times under certain circumstances. These are, however, the published tariffs.

The following table will show the part each of the above-named companies has in the movements of navigation during one month at the port of Jaffa:

Company.	Steamers arriving and departing.	Remarks.	Company.	Steamers arriving and departing.	Remarks.
Austrian Lloyds...	8	Service regular.	Faber (French)....	1 or 2	Not very regular.
Messageries Maritimes.	4	Do.	Bell's Asia Minor.	1	Do,
Russian Company..	4	Do.	Knott's Prince Line.	1	Do.
Khedivé	8	Regular service between Alexandria and Messina.	Machsussieh (Turkish).	1	Do.

The Khedivé is a thriving company, whose competition the others feel.

The Faber, Bell, Knott, and Machsussieh lines are seldom used by travelers.

RAILWAYS.

Within the province of the Jerusalem consulate there is but one railway. This connects Jerusalem, the chief city, with Jaffa, our only seaport. This road, called Chemin de Fer Ottoman de Jaffa à Jerusalem, while holding title from the Turkish Government, is in reality a French corporation. It is the policy of the Turkish Government to keep a nominal control over all railways and highways within its territories.

The total length of this railroad is 53 miles; it is single track and narrow gauge. Stations average 9 miles apart, there being five between Jaffa and Jerusalem. None of the intermediate stations are of any importance.

The line is in fair condition, but the accommodations for passengers are very bad, and would not be tolerated by the traveling public of Europe or the United States. The line is difficult to keep in first-class condition owing to the heavy grades and short curves among the mountains. With the means at hand, the company is to be commended for its success in keeping the roadbed in as good condition as it is. In the distance of 53 miles the ascent is nearly 2,500 feet, most of which is made during the last half of the distance.

The daily service consists of one passenger and one freight train each way. The first-class fare between the termini is $3. A round-trip ticket is sold for $4.

Freight is divided into three classes. The rates per ton from Jaffa to Jerusalem are $3.90, $3.50, and $3, for first, second, and third class, respectively.

HIGHWAYS.

There are three carriage roads branching from Jerusalem that are worthy the name of highways, viz, one leads westward to Jaffa, one southward to Bethlehem and Hebron, and one eastward toward Jericho.

This latter is not completed. A highway also runs from Jaffa northward to Tantura. These roads are in good condition, but there is so little carriage traffic over them that it requires little attention to keep them in order. Their average width is about 50 feet. All other roads through the country are but mountain trails, and wretched beyond description. All travel is on horse, camel, or donkey back, likewise all transportation of goods to and from the larger towns and villages of the north.

EDWIN S. WALLACE,
Consul.

JERUSALEM, *June 16, 1894.*

MASKAT.[1]

OCEAN LINES.

The only line of steamers carrying passengers, mails, and freight, calling regularly here, is the coast line of the British India Steam Navigation Company, Limited, running from Bombay and Karachi[2] to Maskat and ports in the Persian Gulf, with Bassorah, Asiatic Turkey, as the terminal port. These steamers leave Bombay every Thursday and remain at Karachi until arrival of same company's (Peninsular and Oriental) steamer with mails and passengers from Brindisi. They leave Karachi on Tuesday morning. At Maskat, the steamers call every alternate Thursday, going to Bassorah, and every other Thursday on the return voyage.

The British India Steam Navigation Company, Limited, London, own 101 steamers, the total tonnage of which is 249,492.

The following are the steamers of this company at present on the Persian Gulf line:

Name.	Gross tonnage.	Nominal horse-power.	Name.	Gross tonnage.	Nominal horse-power.
Assyria	1,495	200	Kilwa	1,552	200
Chanda	2,022	221	Pemba	1,536	200
Java	1,477	180	Simla	1,615	180

[1] Also written Muscat.
[2] Also written Kurrachee.

First-class passage rates in rupees.[1]

From—	To—								
	Karachi.	Gwadur.	Maskat.	Jask.	Bandar Abbas.	Lingah and Bahrein.	Bushire.	Fao and Fallahi.	Bassorah.
Bombay	60	86	105	120	128	143	180	195	200
Karachi	.....	38	75	90	105	120	150	165	168
Gwadur	.....	.....	53	68	83	90	128	143	150
Maskat	.....	.....	.....	30	56	64	105	120	124
Jask	.....	.....	.....	.....	30	53	90	105	126
Bandar Abbas	.....	.....	.....	.....	.....	38	68	83	90
Lingah and Bahrein	.....	.....	.....	.....	.....	.....	53	75	83
Bushire	.....	.....	.....	.....	.....	.....	.....	26	34
Fao and Fallahi	.....	.....	.....	.....	.....	.....	.....	.....	20

[1] The rupee, silver, was valued by the United States Treasury Department as follows, on the dates given: 1894, January 1, 24.5 cents, April 1, 22.1 cents; July 1, 21.7 cents; October 1, 22 cents. 1895, January 1, 21.6 cents; April 1, 21 cents.

This table will also serve to show the ports on the Persian Gulf touched at by the mail steamers.

Average rates of freight are 10 rupees per ton of 20 hundredweight, or 40 cubic feet, to all ports.

Specie is charged at from three-fourths to one-half of 1 per cent, according as value is small or great.

The mail steamers on the Persian Gulf line receive a small annual subsidy from the British Indian Government.

RAILWAYS, RIVERS, AND HIGHWAYS.

There are no railways or navigable rivers in Oman, and no canal lines or roads have been constructed in this country. There are no wheeled vehicles in use; passengers and goods are conveyed by camel or donkey along narrow tracks worn by the animal's feet.

A. MACKIRDY,
Vice-Consul.

MASKAT, *May 9, 1895.*

PERSIA.

ANCIENT ROAD AND BRIDGE BUILDERS.

In surveying the lines and means of communication for the conveyance of travelers and merchandise, as now existing in Persia, we find ourselves face to face with conditions, methods, and systems—almost unchanged since the very dawn of history—which have survived dynastic revolutions, the overthrow of social and religious institutions, and the contraction and expansion of political frontiers.

In the course of her long existence Persia has experienced to the full the vicissitudes of empire; but whether Assyrian, Scythian, or Median; whether Greek, Roman, or Arab has striven to control her destinies;

whether the offering of fire has flamed from the altars of Zoroastrian temples or the priest of Islam calls the faithful to prayers from the minaret of the mosque, all seem to have agreed that in the means of both internal and external intercourse no change was necessary.

At certain periods of Persian history, architecture, sculpture, engineering, and building attained a high state of perfection, and palaces and bridges, and dams thrown across rivers for preserving and raising the water for the purposes of irrigation, attest the possession of remarkable skill and perseverance on the part of the promoters and builders. But though large sums of money must have been spent and vast numbers of people employed in raising these structures, comparatively little attention seems to have been paid to roadmaking.

The unconfined tracks, without landmark or guidepost, tending in one direction with more or less irregularity, and made visible by the ceaseless tramp of the truck animals, form the highways, and the camel, the mule, the horse, and the ass, the ordinary vehicles of transport, whilst the caravansary and chapar-khaneh (posthouse) are the resting places for man and beast.

The little attention paid by the Persians of ancient and mediæval times to roadmaking was no doubt partly owing to the general absence of wheeled carriages, both in commercial enterprise and local industry, and the more ambitious schemes of war. It appears, however, from the rock sculptures at Persepolis that a small two-wheeled vehicle did exist in those remote times, but it would seem from the surroundings that it was used rather in domestic than in warlike pursuits.

In primitive times, when the boundaries of states were but ill-defined and the executive or governing power, which not infrequently decreased in force in proportion to the distance from the center, mountains formed at the same time both the limits of the kingdom and its bulwarks of defense. It is, therefore, not surprising that the Persian mountain ranges afford so few traces of ancient roads or roadmaking.

In the mythological ages, moreover, superstition and dread peopled those vast solitudes with giants, demons, and genii, whose presence and neighborhood it was prudent to avoid, and in later times their fastnesses afforded safety and protection to bands of robbers, who plundered the richly laden and defenseless caravans in the plains below.

It is probable that these and a variety of other considerations had the effect of retarding, through long periods, the construction of roads, thus leaving traffic and merchandise to find their means of increase and distribution the best way they could.

During the reign of the present Shah considerable improvements have been made in certain districts where the ordinary traffic was carried on under great difficulties and dangers, and although the pack animal has not been superseded, transport and travel have been much facilitated. It is true that they are of local rather than international

interest and advantage, yet they mark an advance in the right direction, and demonstrate that the ruler and his advisors desire to give a freer and smoother circulation to the products and industries of their own country. There are, however, two comparatively new roads, which, as they have more than a local interest, will, in their proper place, require separate mention.

In reviewing the past and present condition of the historic kingdoms of the East, whose inherent vitality has preserved them from the processes of natural and unnatural decay and extinction, and whose laws, customs, and habits, which have been made sacred by their associations and antiquity, and even in the fierce and feverish light of modern times command our sympathy and curiosity, it must be admitted they have many and weighty reasons for moving slowly and carefully in the way of improvements.

The roads of Persia, with the exceptions mentioned above, are generally of one complexion and in much the same condition. Variations in the surroundings of mountain, ravine, or plain have each their peculiar features, yet in spite of these there is a close family likeness in all. Their one peculiarity when confined to the plains is a great number of parallel cattle tracks of undefined extent. Even when the road leads through cultivated lands it is considered advisable and economical to allow the caravans a pretty large margin. The roadway, therefore, may be half a mile or only a few yards wide. In mountain passes it is often confined to one single track, where it is impossible for the animals to pass each other. The roads which have been constructed under the auspices of the present Shah in mountainous districts bordering on and in the province of Mazenderan are from 10 to 12 feet wide. These have been very useful in facilitating and stimulating the local trade in rice, timber, and charcoal, and also in promoting the growth of trade with the small port of Meshedi-sar, on the Caspian, about 70 or 80 miles west of the more important town of Astrabad.

It would be difficult to assign any distinct period for the erection of those vast structures of antiquity, of which the ruins of Persepolis remain as a proof of the engineering and artistic skill of the builders. These are remnants of an age too remote to exercise any influence whatever upon the present. They can only have a historical and archæological interest for the antiquarian and the traveler.

The Sassanian dynasty, the last of the ancient lines of Zoroastrian kings who occupied the throne of Persia from about A. D. 226 to A. D. 650, or upward of 400 years, devoted much attention to the building of bridges and the construction of dams and other works of public utility for the benefit of their subjects and the prosperity of their kingdom.

THE CARAVANSARY BUILDERS.

The Saffavian kings, who reigned over Persia from toward the close of the fifteenth to the beginning of the eighteenth century, a period of

nearly 250 years, recognized the necessity, and considered it a pious duty, to provide shelter, protection, and refreshment to men and animals compelled at all seasons of the year to traverse the lonely and dangerous highways. They were the great caravansary builders, and such was the interest they took in the erection of these buildings that both sexes joined in the enterprise. Many of these caravansaries, especially those erected by Shah Abbas the Great, who died in 1628, are still standing. They are mostly built of hard-burned bricks, and have resisted the destructive influences of time, weather, and neglect with remarkable success. It is, however, but just to remark that a great many caravansaries have been built in different parts of the country, both from public and private sources, since those days.

There is little variety in the architecture of these necessary, but not always comfortable or convenient, habitations. They are always in the form of a quadrangle, three sides of which are usually taken up by the stables and the fourth side by rooms for travelers, storerooms, etc. The middle of the square is generally occupied by a large covered tank for the supply of water to men and animals.

Caravansaries exist along all the principal highways, at varying distances of from 16 to 24 miles apart, and form the ordinary stages or day's journeys of the caravans. As it is necessary that they should be in more or less close proximity to villages, from where a supply of fodder can be obtained for the animals, this partly accounts for the difference in the number of miles in the stages. Sometimes other causes operate, as in more highly civilized countries.

The accommodation of the caravansary is not very refined, and seldom tempts the traveler to stay longer than is necessary for rest and refreshment. Those, however, to whom time is of little moment and who take a good supply of household furniture with them, will find a day's residence in a caravansary, if not an absolute pleasure, at least a novelty. The bill of fare is always a very moderate one, consisting of fowls and eggs, but those who know the resources of these primitive wayside inns generally provide themselves with a few supplementary stores.

POSTHOUSES.

Besides the ordinary caravansaries, each great road of public or national importance has a system of posthouses. These are generally in the vicinity of the caravansaries and at about equal distances apart. At these places relays of rather small, wiry horses are kept, and if the traveler's patience is not equal to the slow monotony of the caravan, he can be furnished with supplies of horses, and with courage and endurance he may cover from 60 to 100 miles a day. The cost of one horse is, at the present time, about $2\frac{1}{2}$ cents a mile. But as, by the rules and necessities of this service, the traveler must be accompanied by a postboy, or rider, he is obliged to take two horses, which increases the fare to about 5 cents a mile.

The accommodation at the posthouses is more comfortable than at the caravansaries, although the bill of fare does not offer any greater variety.

HIGHWAYS.

Teheran is connected with the outer world by fine roads, from which, as will be seen presently, there are certain branches of more or less importance. These form the ordinary lines of communication for the transport of goods and the conveyance of passengers and mails, and may be briefly stated as the Tabriz, Hamadan, Bushire, Meshed, and Astrabad roads.

TAERIZ ROAD.

Teheran to Kasvin, 6 stages, 96 miles.—This road was constructed for wheeled vehicles about sixteen years ago. It is about 50 feet wide, and, as it lies generally over a gravelly bed, macadamizing was unnecessary. For ten months in the year it is in good condition. During January and February, on account of the heavy falls of snow, the traffic is sometimes delayed. Conveyances for the carriage of travelers and mails, consisting of closed and open spring vehicles, and small covered and uncovered wagons, all drawn by horses, are kept in readiness both in Teheran and Kasvin, but not at the intermediate stations. The fare for the closed spring carriage with four horses, sufficient for two or three persons, is about $17; for the open spring carriage with three horses, for two persons, $12.50, and for the wagon and three horses for two persons, $7.50, for the whole journey. Wagons for the conveyance of the traveler's baggage, to accompany the carriage, can also be had. The transport of goods by wheeled carriage is only carried on to a limited extent. The road is worked by a private individual, who is at the present time governor of Kasvin.

Kasvin to Zenjan, 5 stages, 104 miles.—Road generally level.

Zenjan to Tabriz, 5 stages, 104 miles.—About 50 miles from Zenjan the road crosses a range of hills of considerable altitude, called the Goflan Kuh; with this exception the road presents no difficulties. Wheeled vehicles can traverse the whole distance from Tabriz to Teheran, but on account of the hills above mentioned, the ordinary pack and riding animals are preferred.

Tabriz to Julfa, on the River Aras, Russian frontier, 4 stages, 80 miles.—The road is fairly level and passable for wheeled carriages. Travelers from Julfa for Europe take the Russian mail-cart service to a station on the Tiflis-Baku Railway, called Agstaffa, about 100 miles southeast from Tiflis.

Tabriz to Damadim, Turkish frontier, 8 stages, 226 miles.—This road presents no serious difficulties, but all traffic is carried on by pack animals. Camels are largely used on this road. All European goods (Russian excepted) are imported by this route via Trebizonde, on the Black Sea, for the northwest, as well as large quantities for Kasvin,

Teheran, and other places. A transit duty of 1 per cent is charged at Trebizonde on all goods en route for Persia.

From Tabriz to Oroomiah distances vary slightly, according as the south or the northeast of the lake is chosen, but the distance is, more or less, about 130 miles. If some small steam craft could be launched on the lake, and a waterway opened up between the two towns, a great saving of time and fatigue would be effected.

Branch road.—Kasvin to Resht, 6 stages, 120 miles: The second, third, fourth, and most of the fifth stages from Kasvin lie across the Elburz, with its offshoots and neighboring ranges of mountains. Although the passes are often very steep and the road frequently overlooks deep precipices, comparatively few accidents occur to either men or animals, on account of the width being seldom less than 10 feet. A concession was granted by the Shah last year to a Russian syndicate to construct a cart road from Kasvin to Resht, but a beginning has not yet been made, although it is reported that operations will be commenced in two or three months. The majority of Russian goods, particularly sugar, are transported to Teheran by this route. This, moreover, is the most direct trade route to all parts of Europe, but on account of the prohibitive transit duty levied on all goods passing through Russia from the west, it is but very rarely used.

HAMADAN ROAD.

Teheran to Hamadan, 8 stages, 172 miles.—This road, although in places hilly and presenting a more or less uneven surface, offers no serious obstacles to the free and regular transport of goods. The principal business of Hamadan is the tanning of leather.

Hamadan to Kermanshah, 5 stages, 120 miles.—With the exception of a few hills of no great height above the level of the plateau, this road is over an undulating surface. The well-known rock sculptures on the face of the mountain called Bi-situn are at distances of about 8 miles and 24 miles west of Kermanshah, in more or less close proximity to the road.

Kermanshah to Khanakin, Turkish frontier, 7 stages, 132 miles.—Part of this road lies over wooded hills, but to the ordinary animal carriage it offers no insuperable difficulty. From Khanakin to Bagdad, on the Tigris (Turkish territory), the distance is about 112 miles.

TEHERAN-BUSHIRE ROAD.

This road lies directly south and passes through the important cities of Ispahan and Shiraz. The celebrated ruins of Persepolis and the gigantic rock sculptures are in the immediate vicinity of this road, 40 miles north of Shiraz. Goods are imported from Europe, India, China, and other parts of the world by this route for most of the southern and central provinces and in smaller quantities for Teheran. This is also the mail route for India and the Far East.

Teheran to Koom, 6 stages, 196 miles.—In the early part of 1890 the Imperial Bank of Persia obtained a concession from the Persian Government to construct a cart road from Teheran to the Karoon River, which, through the intervention and at the request of Sir H. Drummond Wolff, the English minister at Teheran, had recently been thrown open to navigation. It was hoped and believed that through these concessions, giving greater facilities and expedition for transport and opening up large tracts of territory, hitherto, from the absence of road communications, practically closed to the outside world, a great impulse would be given to internal industries, and foreign merchandise would more rapidly reach its destination, be sold at lower rates, and yet give a more profitable return to the importers. It would, moreover, it was contended, enable European goods to compete more successfully with their Russian rivals, which within the last few years have deservedly risen in reputation and increased immensely in extent. The failure, however, of certain enterprises connected with Persia and the rather sudden and unexpected fall in the Imperial Bank of Persia's shares gave a shock to Persian credit in London which proved fatal to the prospects of the road.

The bank, notwithstanding these adverse circumstances, provided the money to construct the first section, from Teheran to Koom. A road 16 feet wide, macadamized where the soil was of a clayey or spongy nature, with bridges and guest houses of a more modern type, and with a supply of necessary conveniences for the accommodation of travelers, was finished by the end of 1892. A service of wheeled vehicles for the conveyance of passengers and merchandise was organized and started soon after the completion of the road. A fare of $2.50 was charged for each seat in the coach, for the whole journey.

Koom is a holy city to which large numbers make pilgrimages to offer their devotions at the shrine of the saint. These, it might be supposed, would have taken advantage of this more rapid and comfortable method of reaching their destination, but from some cause or other, probably superstition, it did not attract sufficient numbers to pay for the daily service. Koom being but a small town, and the road forming but a short section of the Teheran-Bushire highway, the difference of two days in the arrival of goods at either end did not offer sufficient inducements to merchants to substitute the wagon for the camel. Consequently, about eight months ago, the service was given up and the horses and vehicles sold. At the present time a toll of 5 cents a head is charged on all quadrupeds that pass over the road, with the exception of large flocks of sheep and goats, on which one-half cent a head is taken. This, I believe, realizes a gross income of a little over $100 a week. The road is in a good state of repair, and it would be of great public advantage if it could be carried through to the Karoon River.

Koom to Kashan, 3 stages, 64 miles.—This division is almost level and presents no difficulties whatever. Tobacco is grown to a large extent

in the neighborhood of Kashan, and the town itself is the center of a considerable silk and velvet weaving industry.

Kashan to Ispahan, 5 stages, 108 miles.—Part of the first and all the second stages lie across the Kohrood range and its offshoots, which at the highest point of the pass reaches an altitude of about 6,000 feet. Beyond this the road is smooth.

Ispahan to Shiraz, 12 stages, 306 miles.—This road, though rough and hilly in some places, presents no serious difficulties either for travelers or transport. Ispahan is interesting on account of its many and fine relics of its former greatness, when it was the capital of the Persian Kingdom; for its splendid old palaces, its fine bridges, extensive gardens, and rich fruits. It is also the chief manufacturing town of Persia, and produces carpets, brocades, armor, and a variety of steel and brass articles, both useful and ornamental. Some of the older specimens are of rare beauty and durability, and are much sought after by connoisseurs and antiquarians. Considerable quantities of opium, cotton, and tobacco are grown in the neighborhood of Ispahan.

Shiraz to Bushire, 10 stages, 186 miles.—For a distance of 40 miles from Shiraz the road lies through an undulating country. Then for about 80 miles it traverses a succession of mountains, intersected with valleys, some of much fertility. This is the region of the date palm, and the narcissus flourishes in its uncultivated, natural state. Some of these mountains are called kotals, which may be rendered mountain-hill, and the road is reputed to be the worst in Persia. The highest point is 7,400 feet. The transport of goods is effected by mules and donkeys, the passes being too steep and narrow for camels. Bushires is the chief Persian port of the gulf, and is the depot for the principal part of the trade of south Persia. There is a regular service of steamers once a fortnight with Bombay, and once a month or oftener directly with England.

Branch road.—Kashan to Yezd, 13 stages, 316 miles: This road is comparatively free from serious impediments, crossing no mountains of great elevation. Yezd has considerable manufacturing industries, in shawls of the cashmere pattern and texture (although of inferior quality), rugs, prints, camlets, and other stuffs. Opium and asafetida are grown in the neighborhood.

Yezd to Kerman, 10 stages, 250 miles: This road is free from any unusual obstacles. Shawls and a few other materials are manufactured at Kerman.

Kerman to Bendar Abbas, 11 stages, 360 miles: This road is mountainous, but permits of the passage of camels. Bendar Abbas, east of Bushire, is in importance the second Persian port on the Persian Gulf, and is a considerable center both for export and import trade.

TEHERAN-MESHED ROAD.

This road, which is very much used by pilgrims visiting the holy shrine at Meshed, was, until Russia subdued the Tartar tribes of cen-

tral Asia, dangerous for a considerable distance from the incursions of these freebooters. Bands of marauders used to sweep over the frontier, plunder whole caravans and villages, and carry off the people into captivity. It has, however, for some years past, been free from the terror of these barbarians.

Teheran to Shahrood, 11 stages, 68 miles.—This road is nearly level all the way, and presents no features of interest.

Teheran to Nishapoor, 10 stages, 240 miles.—This road presents the same general features as the Teheran-Shahrood road. The famous turquoise mines are about 40 miles from Nishapoor.

Nishapoor to Meshed, 3 stages, 76 miles.—This road traverses some considerable hills, but they offer no serious impediment.

Branch road.—Shahrood to Asterabad, 64 miles: This road is less difficult to traverse than the one mentioned below, and is possible for wheeled vehicles. I mention this branch because wool is sometimes sent by this route to Europe and I think even to the United States.

TEHERAN-ASTERABAD ROAD.

This, like most of the roads terminating at the Caspian, is very mountainous. The present Shah has, however, made great improvements, but not sufficient to supersede the camel or mule by wheeled conveyances. Distance about 300 miles.

COASTWISE AND RIVER ROUTES.

The Caspian Sea, which is practically a Russian lake, is, except to Russia, of very little advantage to European trade, although the conditions of transit in Russia for goods going west are much more favorable than for those coming east.

The Karoon River in the south, which forms a junction with the Tigris near the small town of Mohamerah, is the only navigable river in Persia. This river was, by the action of the Shah and his Government, thrown open to the commerce of the world about five years ago; and although the results have not realized the expectations then formed of the concession, on account of the failure to construct the projected road it has not been abandoned.

A steamer of 300 tons burden and 100 horsepower, belonging to Lynch Bros., an English firm, navigates the river from Mohamerah to Ahvaz, a distance of 110 miles. Two small steamers, one of 20 tons and the other of 30 tons, ply between Ahvaz and Shushter, a distance of 60 miles. The entire journey from Mohamerah to Shushter is accomplished in about twenty-four hours; in a little less time downstream.

Pure petroleum springs exist in the neighborhood of Shushter, but up to the present no serious attempt has been made to develop the workings. The oil collected is used for the most part in painting.

Steamers navigating the Persian Gulf, and also those on the Caspian Sea, call at all Persian ports. Coasters, as such, do not exist in either.

RAILROADS.

The only railroad in Persia is a short line, about 6 miles long, constructed tentatively between Teheran and a village called Shah-Zadeh-Abdul-Azim—the site of the ancient city of Rhey or Rhages—which contains a well-known shrine, whither great numbers of people from Teheran and the surrounding districts repair to present their offerings and devotions. This line was constructed by a Belgian company about seven years ago, but as it depends almost entirely upon the pilgrim traffic for its revenue, it has been generally worked at a loss.

SUPERVISION OF ROADWAYS.

From what has been already said about Persian roads in general, it will be readily inferred that, with two exceptions, and certain local roads, they are under no supervision or control of any government department or public or local body whatever. If a bridge is carried away or destroyed, it is repaired either by the people of the district or by the government of the province in which it is situated. In some cases, where the work is of great importance, it is done by the central government.

Tolls are collected on each animal that passes certain points of the roads, averaging 5 to 10 cents per head. The fund thus provided is used to pay the guards employed for the protection of the traffic.

CARAVAN TRAVEL.

It would be impossible to form even an approximate estimate of the average number of caravans that pass any given place during each day of the year. Any attempt would be the merest guess, and would prove altogether misleading. The importance and value of statistics have not yet been realized in Persia. The most reliable statistics relative to the exports and imports are those collected by European merchants and consuls, but these have to be received with many reservations.

FREIGHT RATES.

The average cost for the transport of goods is about 25 cents a ton per mile. This, however, is liable to be considerably modified by the supply and demand, for even Persian camel and mule men are fully alive to their own interests, and when there is an opportunity of increasing the ordinary rate, do not fail to take advantage of it.

The usual charge for a riding horse to accompany a caravan is about 2 cents a mile, but the direction in which the caravan is going not infrequently makes a great difference. For instance, from Resht to Teheran the fare might be 3 cents, while from Teheran to Resht it might be less than 2 cents per mile. This is accounted for by the fact that a great deal more is brought to Teheran than is sent out of it. And this is the case on all the great mercantile roads.

DISTANCES.

Having already given the lengths of the different sections of the great roads, it only remains that I should give the total lengths of the roads leading out of Teheran:

To—	Miles.	To—	Miles.
Julfa, Russian frontier, via Tabrez	476	Bushire	758
Damadim, Turkish frontier, via Tabrez	606	Bendar Abbas	1,048
Resht	216	Meshed	588
Khanakin, Turkish frontier, via Hamadan	444	Asterabad	200

The distances given throughout this report are those of the postal service. They are not mathematically correct, but as they are the basis for charges for the post horses they will be more useful than exact measurements.

MAIL SERVICE.

The mails leave Teheran for Europe every Monday and Thursday, and should arrive on Tuesday and Saturday; for India and the Far East they leave on Saturday, but the arrival is uncertain, generally on Thursday or Friday.

Letters reach England in a little over three weeks, and the United States in about a month, or a little more.

ILLUSTRATIONS.[1]

The illustrations accompanying the report are rather of an archæological and antiquarian character than having any direct bearing on the subject of the report. They represent, however, certain aspects of civilization which are now rapidly passing away, and to such as take an interest in these studies, they may prove of some value.

JOHN TYLER,
Vice Consul-General.

TEHERAN, *June 24, 1894.*

[1] Filed in the Bureau of Statistics, viz: (1) Sculpture procession, Persepolis; (2) Ruins of Persepolis; (3) Nakshi Rusteen, near Persepolis; (4) Sculpture, Persepolis; (5) Tomb of Cyrus, near Persepolis; (6) Old stone bridge near Ispahan; (7) Caravansary built by Shah Abbas; (8) Modern caravansary; (9) Posthouse and carriage; Bisitun and caravan of camels and horses; (10) Rock sculpture, Taki-Boostan, Bisitun; (12) Mountain road in the province of Mazenderan; (13) Tobacco caravan of camels; (14) Map of Persian highways.

RAILWAYS, TELEGRAPHS, and STEAMSHIP ROUTES in INDIA

Scale 1 Inch = 192 Miles.

200 100 0 200 400

70° 78° 86° 94° 102°

28° 20° 12°

ARABIAN SEA — BAY OF BENGAL

KARACHI · BOMBAY · CALCUTTA · MADRAS · RANGOON

ANDAMAN ISLANDS · NICOBAR ISLANDS

REFERENCES.

Railways open
Do. sanctioned or under construction
Telegraph lines which are not on railways
Steamship routes
Cable

Railway.

1. Amráoti.
1A. Anklesvar-Nandod.
2. Assam-Bengal.
4. Bengal and North-Western (Company's Section).
5. Bengal Central.
6. Bengal Dooars.
7. Bengal-Nágpur.
8. Bezwada extension.
8A. Bezwada-Madras (Rayapuram-Ennore Section).
9. Bhávnagar-Gondal-Junágarh-Porbandar.
10. Bhopal-Itársi.
11. Bhopal-Ujjain.
12. Bina-Guna.
13. Bombay, Baroda, and Central India.
14. Burma (State).
15. Calcutta Port Commissioners'.
16. Cherra-Companyganj.
17. Cooch-Behar.
18. Darjeeling-Himalayan.
19. Delhi-Umballa-Kalka.
20. Deoghur.
21. Dhond-Manmád.
22. Dibru-Sadiya.
23. East Coast (State).
24. Eastern Bengal (State).
25. East Indian.
26. Gaekwar's Dabhoi.
27. Gaekwar's Mehsána.
28. Gaekwar's Petlád.
29. Godhra-Rutlam.
30. Great Indian Peninsula.
31. Guntakal-Mysore Frontier.
32. Hyderabad-Umarkot.
33. Indian Midland.
34. Jammu and Kashmir.
34. Jetalsar-Rájkot.

Railway.

36. Jodhpore-Bickaneer.
37. Jorhát.
38. Khamgáon.
39. Kolar Gold-fields.
40. Kolháp ur.
41. Lucknow-Bareilly Section, R. & K. Railway.
43. Madras.
44. Márі-Attock.
45. Máyavaram-Mutupet.
46. Morvi.
47. Mushkaf-Bolán.
48. Mu Valley.
49. Mysore-Nanjangúd.
50. Mysore Section, Southern Mahratta Railway.
51. Nilgiri.
52. Nizam's Guaranteed State.
53. North Western (State).
54. Oodeypore Chitor.
55. Oudh and Rohilkhand (State).
56. Pálanpur-Deesa.
58. Pondicherry.
59. Rájkot-Jamnagar.
60. Rájpura-Bhátinda.
61. Rajputana-Malwa.
62. Rohilkhand and Kumaon (Company's Section).
63. Southern Mahratta.
64. South Indian.
65. Tarkessur.
67. Tirhoot Section, Bengal and North-Western Railway.
68. Wardha Coal.
69. West of India Portuguese.
70. Yesvantpur-Mysore Frontier.

Special Consular—Highways of Commerce—face page 543.

BRITISH INDIA.

RAILWAYS.

The earliest proposals for constructing railways in India were put forward in 1843–44. At that time the palanquin and the house boat were the recognized vehicles for long journeys, both for Europeans and natives. Many reasons in support of their views were brought forward by those who foretold failure, one of the most cogent being that this mode of locomotion was opposed to the religious and social prejudices of the natives, and that they would not patronize it. It was pretty well accepted even by the advocates of the building of railways that when built they would have to seek their dividends from the hauling of freight, for they conceded that the passenger traffic would furnish but small returns. It is rather curious that, in view of this generally accepted condition, the receipts on Indian railways from passenger traffic in the first three years largely exceeded the receipts from goods traffic. To the present day the passenger traffic has continued to show the most extraordinary development.

In 1845 the directors sent out to India Mr. Simms, a railway engineer of experience. He, associated with two officers of the Indian engineer corps, was to suggest, after due inquiry, some scheme of moderate length as a first experiment.

The directors of the East India Company were not averse to the construction and administration of railways in India by the agency of companies; but, recognizing the haphazard way in which schemes had been launched in England, they wisely determined that in India the trunk lines at least should be constructed on certain conditions which would give the Government powers of control, and, if necessary, powers of purchase. They therefore suggested for consideration that the detailed plans and estimates of any project and the constitution and terms of agreement of any proposed company should be submitted for the examination and approval of the Government, and that the books and accounts should at all times be open to inspection by officers appointed for the purpose. In this is seen the first germ of a policy and the commencement of a system of control which has since been elaborated and has become the distinguishing feature of the Indian railway system.

In February, 1846, Mr. Simms drew up a memorandum in which he made the following suggestions of terms which should be offered to capitalists: As to the assistance to be given by the Government, he proposed that a lease should be given to a company affording it power to construct, maintain, and hold certain lines for a term of years; that land should be given by the Government free of cost for permanent works; that no tax should be imposed on the railway as it proceeded, and that a company should have complete control over its servants. On the

other hand, the company should make the necessary surveys and plans, and submit them for approval; should construct the line in accordance with approved specifications, and maintain all works in perfect repair until the expiration of the lease, when they should be handed over to the Government without payment. No deviation from a sanctioned plan was to be made without the further sanction of the Government, and the inspecting officer was to have power to condemn, stop, or order the reconstruction of any work. If any company failed in its engagements, the Government was to have power to take the whole property into its hands and do with it as it thought fit. Further, he proposed that on the completion of any line every working regulation, rule, or by-law, the tariff rates and fares for goods and passengers, the number of trains per diem and times of starting same, should be approved; in short, every detail was to be submitted for the acceptance of the Government, and no line was to be opened for traffic until all proposed rules had been sanctioned. Moreover, every railway was to carry mails, troops, and military stores at reduced rates. The failure to run one train a day from end to end of a line was to be held to be evidence that the railway had ceased to be used as such. All Indian railways were to be constructed on one specification, worked on one system, and supplied with stock of one uniform pattern, while every company was to keep its accounts in approved forms, and the Government to have power to call for any returns, financial or statistical, that might be thought necessary.

Many of these stipulations show wisdom and sound judgment, and most of them, with certain modifications, became the basis of the terms on which railways have since been built by companies.

The proposal to give land free of cost has been a regular and leading feature in all railway concessions to the present day. As regards the power of becoming eventually the proprietor of railways in India, the Government considered that the option of so doing should be reserved on certain conditions at the expiration of a certain period or of entering into new arrangements with the company. This also became a leading feature in all subsequent contracts. However, it was necessary to add some further attraction to induce capital to invest. This was done by the Government guaranteeing interest at a certain figure. Under this system of guaranty and control the great trunk lines have been built, all on the standard gauge of 5½ feet.

By the end of 1855 the system of railways projected was rapidly being carried out. The outbreak of the mutiny in 1857 threw everything into confusion, and the progress of railway construction was seriously impeded. One good feature of the guaranty system was, however, brought out by the troublous times of the mutiny, viz, money was always forthcoming to carry on the works. With the extraordinary demands on the financial resources of the Government made by the necessities of military operations, railway building, had the Govern-

ment been relied on to furnish the funds, would have had to stop until more propitious times.

In 1869, under Lord Lawrence, the Government inaugurated a policy which radically changed the system of railway building in India. Up to that time the construction of railways under Government control by companies, under a guaranty or some equally effective assistance, had been held to be, if not the most economical, the only possible way of carrying out and administering these works with a due regard to the rights of all concerned. The statesmen who governed India fully recognized and were determined to avoid the dangers of placing in the hands of uncontrolled private corporations the monopoly of the common carrier's business on the highways of the country and of giving to such corporations the power of taxing the production and consumption of the country to as great an extent as they might see fit. Through this retention of complete control of the public highways of the country in the hands of the Government, the companies being guaranteed a satisfactory return and prevented from grinding out more than a reasonable interest on their investment, India has escaped the evils which inevitably arise when the beneficiaries of a public monopoly spend part of the money earned by the favors of legislation in striving to procure further and more favorable legislation or to protect themselves from the efforts of the public to restrain them in their aggressions.

After the experiment had been tried for so many years of building roads by using the credit of the Government indirectly to procure the money, Lord Lawrence saw that it would be cheaper to use directly the credit of the Government to raise money, and to make use of the large number of trained engineers in Government employ in pursuing for the future the policy, as far as was consistent with actual and implied engagements with the existing companies, of the Government building the railways itself. It was estimated that the revenues could bear an annual charge on account of railways, to meet charges for guaranteed interest, land, and loss by exchange, of £2,000,000 ($9,733,000). An estimate of the probable future earnings of the existing lines and of the new lines to be made seemed to show that the country might afford to invest £3,750,000 ($18,249,375) yearly in the prosecution of railway extension, and at the end of twenty years the yearly charge on the revenues would be reduced to about £1,000,000 ($4,866,500). In estimating the net charge for interest on new lines it was, however, assumed that the rate of interest would be 5 per cent, a figure which was largely reduced, and is now nearer 3½ per cent. The gross average earnings of all Indian railways were estimated to reach £30 ($146) per mile per week (at that time 300 rupees). After twenty years, although circumstances have altered since this estimate was made, and many thousands of miles of military and famine lines have been built which were not then contemplated, the actual figure has, as it happens, closely approxi-

mated to this. It was, during 1891–92, 286 rupees ($139) per mile per week.

At this period, also, the idea of a uniform gauge of 5 feet 6 inches for the whole country was abandoned, and an extensive scheme of light lines on narrow gauges, suited to the economic and financial condition of the country, was inaugurated as an adjunct to the main trunk system of broad-gauge roads. A gauge of 1 meter (3 feet $3\frac{3}{8}$ inches) was decided upon, and on this gauge up to date over 7,000 miles of road have been built.

This work has been done through the agency of a railway branch of the public works department of the Government, into which were drafted most of the engineers then (1870) in Government service who had had railway experience in England, added to those who were available from the staffs of the guaranteed companies and a certain number of royal engineers. The money for this system of direct construction by the State was raised in London by the secretary of state on the credit of Indian revenues.

The sums expended on railway extension between the fiscal years 1870–71 and 1891–92, the rate of interest, and the rate of sterling exchange on the rupee are given in the following tables. The figures of expenditure include construction by direct State agency and the sums spent in recent years indirectly by the State through the agency of assisted companies.

Sums expended on State railways.

Financial year.	Sterling.			Equivalent in United States money.		
	Borrowed money.	Revenue.	Total expenditures.	Borrowed money.	Revenue.	Total expenditures.
1870–71	£452,748	£9,569	£462,317	$2,203,398	$46,567	$2,249,865
1871–72	650,170	4,175	654,345	3,164,252	20,318	3,184,570
1872–73	1,430,047	14,863	1,444,910	6,959,323	72,331	7,031,654
1873–74	2,424,526	39,409	2,463,935	11,798,956	191,784	11,990,740
1874–75	3,106,430	114,481	3,220,911	15,117,441	557,122	15,674,563
1875–76	3,245,401	29,680	3,275,081	15,793,743	144,438	15,938,181
1876–77	2,965,110	38,260	3,003,370	14,429,701	186,193	14,615,900
1877–78	4,158,174	50,896	4,209,070	20,235,754	247,685	20,483,439
1878–79	3,465,221	171,782	3,637,003	16,862,498	835,977	17,698,475
1879–80	2,987,383	1,786,155	4,773,538	14,538,099	8,692,323	23,230,422
1880–81	3,212,893	2,317,395	5,530,288	15,635,543	11,277,603	26,913,146
1881–82	2,213,773	1,131,470	3,345,243	10,773,326	5,506,299	16,279,625
1882–83	1,883,542	347,019	2,230,561	9,166,257	1,688,768	10,855,025
1883–84	3,382,367	470,486	3,852,853	16,460,289	2,289,620	18,749,909
1884–85	3,526,152	1,209,958	4,736,110	17,160,018	5,888,261	23,048,279
1885–86	4,712,828	1,221,055	5,933,883	22,934,977	5,942,264	28,877,241
1886–87	5,123,105	406,635	5,529,740	24,931,590	1,978,889	26,910,479
1887–88	2,251,776	80,945	2,332,721	10,959,279	393,197	11,353,197
1888–89	1,178,111	23,308	1,201,419	5,733,277	113,458	5,846,735
1889–90	2,794,458	19,734	2,814,192	13,599,618	96,036	13,695,654
1890–91	2,881,783	54,512	2,936,295	14,024,196	265,283	14,289,479
1891–92	2,770,336	648,028	3,418,364	12,481,840	3,153,628	16,635,468

Average rate of interest for loans and value of rupee, 1870 to 1892.

Financial year.	Average rate of interest for loans.	Value of rupee.		Financial year.	Average rate of interest for loans.	Value of rupee.	
		In sterling exchange.	In United States money.			In sterling exchange.	In United States money.
	Per cent.	*s. d.*	*Cents.*		*Per cent.*	*s. d.*	*Cents.*
1870–71	3.98	1 10½	44.7	1881–82	3.58	1 7⅞	39.2
1871–72	3.93	1 10¼	44.6	1882–83	3.97	1 7½	38.9
1872–73	3.93	1 10¾	44.8	1883–84	3.97	1 7½	38.9
1873–74	3.90	1 10⅜	44.4	1884–85	3.20	1 7⅜	39.1
1874–75	3.94	1 10⅛	44.2	1885–86	3.52	1 6¼	36.7
1875–76	3.98	1 9⅝	43.3	1886–87	3.46	1 5½	35
1876–77	3.92	1 8½	41.1	1887–88	3.46	1 5	34
1877–78	3.94	1 8¾	41.2	1888–89	3.12	1 4⅜	32.1
1878–79	3.96	1 7¾	39	1889–90	2.98	1 4½	32.3
1879–80	4	1 8	40.4	1890–91	3.02	1 6	36.3
1880–81	3.58	1 8	40.4	1891–92	3.18	1 4¾	32

The terrible famines which devastated parts of India during the years between 1874 and 1879 showed that it was necessary to provide some means of quickly and economically moving food products from the districts where the harvests had been abundant to those where they had failed. From this arose, in 1880, the projection of large and important schemes of famine-protection railways. It was found that on account of the expense of the Afghan war and other causes it would probably involve the Government of India seriously if it undertook to furnish the money to carry out this plan. Therefore a reversion in part had to be made to the early system of assisted private companies; so that another era of company lines side by side with State lines was thus commenced under the viceroyalty of Lord Ripon. It was found most profitable to let companies build the lines and work them on a lease, the lines to be considered State property, the Government guaranteeing 4 per cent interest and allowing the company to retain one-fourth of the net profits above that amount, should there be any, the other three-fourths to go to the Government.

Various changes were also found to be advisable in the management of the lines already built. The Government took control of certain lines which had been worked by the companies which had built them, while, on the other hand, it leased to certain companies lines which had been built and managed by the State.

The year 1879 saw the institution of the provident fund for servants employed on State railways, all employees being obliged to subscribe to it and voluntary subscriptions to a certain amount being allowed besides. Government gave depositors the same rate of interest as was allowed to depositors in State savings banks. As an inducement to employees to take an interest in the economical administration of the lines they are engaged on, they received an annual bonus from net profits. This fund enabled the Government before long to abolish the system of pensions for railway employees.

Until the outbreak of the Afghan war in 1878 no comprehensive views had been held in regard to, nor any programme laid down for,

railway construction for purely or mainly military objects. The value of railway communication during this campaign was vividly illustrated in the case of a railway which had been rapidly pushed across the desert to the mouth of the Bolan Pass, where one train in a day of sixteen hours was found to do work which it would have required 2,500 camels to do in a fortnight. The fall in the value of silver has, however, materially interfered with the carrying out of plans laid down, while the serious financial condition in which the Government finds itself, resulting therefrom, has rendered practically impossible the carrying out of any forward policy on a considerable scale in the immediate future.

In regard to the construction of Indian railway lines, it may be said that from the beginning they have been thoroughly and solidly built. The "pioneer" American system is impossible in India. The climate generally, the intensity of the seasons, the profusion of vegetable and insect life, and the general want of suitable timber forbid, both on the score of first and ultimate cost, the rapid and temporary construction which in the Western States is equally possible and economical.

During the viceroyalty of Lord Mayo an impression became prevalent that if the American system could be adopted matters would get on faster and the money go farther. The Government engaged an able and experienced American engineer in order to ascertain what amount of foundation there was for this view. After remaining two or three years in the country this gentleman (Mr. Miller) gave it as his opinion that the conditions of railway construction in India differed entirely from those in the United States, and that practically he had nothing to object to as regards Indian methods or designs, which, in fact, he readily adopted in the works he carried out in India.

STANDARD DIMENSIONS.

The following are the standard dimensions to be observed on railways in India. The maximum, minimum, and fixed dimensions given in this schedule may not be infringed under any circumstances. Where it is proposed to execute any work or to procure any railway material which will infringe these dimensions, the sanction of the Government of India is to be obtained before such work is commenced or order given.

I.—Standard gauge (5 feet 6 inches).

SINGLE LINE.

Minimum width of formation:		
In embankment	feet..	20
In cutting (excluding side drains)	do...	18

DOUBLE LINE.

Minimum width of formation:		
In embankment	feet..	34
In cutting (excluding side drains)	do...	32
Standard distance, center to center, of tracks (out of stations)	do...	14

Maximum angle of curvature:		
In ordinary country (radius, 1,910 feet)	degrees..	3
In difficult country (radius, 955 feet)	do...	6

The angle of curvature is taken as the angle at the center subtended by an arc of 100 feet in length; thus, the radius for a 1° curve is 5,729.578 feet.

Minimum width of ballast at rail level	feet..	11
Minimum depth of ballast below sleepers	inches..	8
Minimum dimensions for timber cross sleepers:		
Length	feet..	9½
Breadth	inches..	9
Depth	do...	5
Minimum area in cross sections	square inches..	50
Minimum number of cross sleepers per mile		1,760

On bridges where the cross sleepers rest directly on longitudinal girders the sleepers are to be spaced not more than 2 feet 6 inches from center to center, and are to be not less than 6 inches deep, exclusive of any notching which may be required.

Rails:		
Maximum clearance of guard rail for points and crossings	inches..	1⅞
Minimum clearance of guard rail for points and crossings	do...	1¾
Minimum clearance of guard rail for curves and level crossings	do...	2
Minimum depth of space for wheel flange from rail	do...	1½

LOCOMOTIVE ENGINES.

The maximum moving dimensions laid down for carriages and wagons apply also to locomotive engines.

Weight on a pair of wheels:		
Maximum under any circumstances	tons..	15
Maximum per foot of diameter	do...	3.75
Weight per foot run of wheel base:		
Maximum for either engine or tender separately in the case of tender engines	tons..	3
Maximum for tank engines	do...	4
Weight per foot run over buffers:		
Maximum for engine and tender together in the case of tender engines	do...	1.625
Maximum for tank engines	do...	1.875
Total gross weight:		
Maximum for tender and engine together in the case of tender engines	do...	86
Maximum for tank engines	do...	60

The weights given are the maximum permissible under any circumstances with engine in working order and full load of fuel and water. In exceptional cases, engines of weights in excess of the specification given may be used under the special sanction of the Government. Such special sanction must be obtained before the engines are ordered, and the application for sanction must be accompanied by a diagram of the proposed engine, giving full particulars, and by a certificate by the Government inspector that the bridges on the section over which the engines are intended to work are of sufficient strength.

CARRIAGES AND WAGONS.

Maximum width:		
From rail level to a height of 4 feet 4 inches above rail level	feet..	10
From a height of 4 feet 4 inches above rail level to a height of 11 feet 6 inches above rail level	feet..	10½

Heights to be taken with vehicle unloaded.

Maximum height from rail level:		
For unloaded vehicle at center	feet	13½
For unloaded vehicle at sides	do	11½
Loading gauge for goods:		
Maximum width	do	10 8/12
Maximum height from rail level at center	do	13 7/12
Maximum height from rail level at sides	do	11 7/12
Maximum gross weight:		
On any pair of wheels	tons	12
Per foot run over buffers	do	1.2

The weights given are the maximum permissible under any circumstances, with the vehicle fully loaded. The weight on a pair of wheels includes the weight of the wheels, axles, axle boxes, and springs.

Wheel base:		
Maximum rigid wheel base for passenger vehicles	feet	16
Maximum wheel base for goods vehicles	do	12
Wheels and axles:		
Standard wheel gauge, or distance apart for all wheel flanges	do	5 3/12
Standard diameter on the tread for new wheels	do	3 7/12
Maximum projection for flange of worn tire below rail level	inches	1⅜
Maximum thickness on tread for tires for passenger stock when worn, inches		1¼
Minimum thickness on tread for tires for goods stock when worn	inch	1

II.—Meter gauge (3 feet 3⅜ inches).

Any infringement of meter-gauge dimensions must be sanctioned by Government as heretofore stated in the case of standard-gauge railways.

Single line.

Minimum width of formation:		
In embankment	feet	16
In cutting (excluding side drains)	do	14

Double line.

Minimum width of formation:		
In embankment	do	28
In cutting (excluding side drains)	do	26
Standard distance, center to center, of tracks out of stations	do	12
Maximum angle of curvature:		
In ordinary country (radius, 1,146 feet)	degrees	5
In difficult country (radius, 573 feet)	do	10

The angle of curvature is taken as the angle at the center subtended by an arc of 100 feet in length.

Ballasts:		
Minimum width at rail level	feet	7½
Minimum depth below sleepers	inches	6
Minimum dimensions for timber cross sleepers:		
Length	feet	6
Breadth	inches	7
Depth	do	4½
Minimum area in cross section	square inches	36
Minimum number of cross sleepers per mile		1,936

On bridges where the cross sleepers rest directly on longitudinal girders the sleepers are to be spaced not more than 1 foot 6 inches apart, center to center, and are to be not less than 5 inches depth, exclusive of any notching.

Rails:

Maximum clearance of guard rail for points and crossings	inches	1¾
Minimum clearance of guard rail for points and crossings	do	1⅝
Minimum clearance of guard rail for curves and level crossings	do	2

The maximum clearance for curves and level crossings will vary according to the radius of the curve.

Minimum depth of space for wheel flange from rail level	inches	1⅜

LOCOMOTIVE ENGINES.

Maximum moving dimensions:

The maximum moving dimensions laid down for carriages and wagons apply also to locomotive engines.

Weight on a pair of wheels:

Maximum under any circumstances	tons	8
Maximum per foot of diameter	do	2.67

Weight per foot run of wheel base:

Maximum for either engine or tender separately in case of tender engines, tons		2
Maximum for tank engines	tons	2.67

Weight per foot run over buffers:

Maximum for engine and tender together in case of tender engines	do	1.125
Maximum for tank engines	do	1.333

Total gross weight:

Maximum for engine and tender together in the case of tender engines	do	46
Maximum for tank engines	do	32

The weights given above are the maximum permissible under any circumstances, with engines in working order and full load of fuel and water.

CARRIAGES AND WAGONS.

Maximum width:

From rail level to a height of 2 feet 9 inches above rail level	feet	8⅙
From a height of 2 feet 9 inches above rail level to a height of 10 feet above rail level	feet	8½

These heights are to be taken with the vehicle unloaded and buffer centers at maximum height of 1 foot 11 inches from rail level.

Maximum height from rail level:

For unloaded vehicle at center	feet	11
For unloaded vehicle at sides	do	10

Loading gauge for goods:

Maximum width	do	8⅔
Maximum height from rail level at center	do	11½
Maximum height from rail level at sides	do	10½

Maximum gross weight:

On any pair of wheels	tons	6
Per foot run over buffers	do	.8

The weights given above are the maximum permissible under any circumstances, with vehicle fully loaded. The weight on a pair of wheels includes the weight of the wheels, axles, axle boxes, and springs.

Wheel base:

Maximum rigid wheel base for passenger vehicles	feet	12
Maximum rigid wheel base for goods vehicles	do	10

Height for floors:

Maximum height above rail level for floor of any vehicle, unloaded (with 2 feet 4-inch wheels)	feet	3

Height for floors—Continued.		
Minimum height above rail level for floor of passenger vehicle, fully loaded (with 2-foot wheels)	feet..	$2\frac{11}{20}$
Minimum height above rail level for floor of goods vehicle, fully loaded (with 2-foot wheels)	feet..	$2\frac{5}{12}$
Wheels and axles:		
Standard wheel gauge, or distance apart, for all wheel flanges	do...	3.056
Standard diameter on the tread for new wheels	do...	$2\frac{1}{3}$
Maximum projection for flange of worn tire below rail level	inches..	$1\frac{1}{4}$
Minimum thickness on tread for tires for passenger stock when worn	do...	1
Minimum thickness on tread for tires for goods stock when worn	do...	$\frac{7}{8}$

The State lines on the standard gauge were laid at first with 60-pound rails, which increased to 70 pounds, and will shortly be 85 pounds, to the yard, as the standard, with 100-pound rails for heavy inclines on which engines of exceptional character are required. In every case the lines have been unusually well ballasted, an essential condition in a country where the heavy rainfall is confined to four or five months in the year, and where timber would be otherwise exposed to rapid destruction by white ants. Special care has been taken in the design and execution of masonry.

The lines are worked on the "line-clear" system. The station master at A can not start a train to B until the station master at the latter has replied in the affirmative to a telegram asking if the line is clear. On receipt of this message the fact is written on a form and handed to the driver of the train to be dispatched. European or Eurasian (half-breed) drivers are generally employed, but on freight and mixed trains natives—mostly Mussulmans and Parsees—are now largely employed in this capacity. They are found to be perfectly competent, within a certain range, and while steady and sober to a far greater degree than the European or Eurasian, their pay need not be more than half of what is necessary for the European. Their weakness lies in an insufficient knowledge of English, and especially in want of "head" and judgment in positions of difficulty.

An important feature in the administration of Indian railways was established shortly after the appointment of a director-general in the first of a series of conferences of railway officials delegated from both State and guaranteed railways. It was desirable that methods which had been adopted on State lines should be discussed and reviewed before a tribunal of experts, and, above all, that, as far as possible, an approach to uniformity of system in all essential points should be aimed at on all railways. The first meeting was held in 1880 and was eminently successful. A code of general rules was agreed to for the working of all lines, agreements were come to as to the interchange of rolling stock, etc., proposals were discussed for the adoption of uniform classification of goods, and rules were agreed to for the preparation of half-yearly statistics. This latter point has been a salient and unique feature in Indian railways, and their value has been amply recognized both by the railway officials and the general public.

In 1889, the Government clearly recognized the necessity of taking steps toward assimilating the practice of the different railways in the construction of their rolling stock. Arrangements were made for the annual assembly of a committee of locomotive and carriage superintendents at which representatives would be found from all the principal lines, including those of the State. The functions of this committee, which was to meet at some large railway center (varying each year), were defined as follows, viz:

> That it should deal with all matters relating to the mechanical improvement of locomotive and carriage stock, and the design, construction, running, and repair of the same; to determine what standards should be adopted, to arrange for such experiments as may appear desirable; to publish papers of professional interest and generally; to consider and report upon all technical, administrative, or financial questions connected with rolling stock, workshops, station machinery, etc., which may be proposed by the members themselves or by the Government of India.

The decisions of the committee are determined by the votes of the members, the voting power of each being regulated by the number of axles in his charge. It is, however, understood that all the decisions of the committee are subject to the approval of the agents, boards of directors, or other authorities for individual railroads, and of the Government of India in all cases. The expenditure in connection with the meetings, cost of models, etc., is met by contributions from each line represented, in proportion to its mean open mileage for the year. The results of the meetings of this committee have been most useful in aiding the general acceptance of uniform patterns for rolling stock, etc.

GENERAL STATISTICS.

Length of lines.—The total length of railway open on the 31st of March, 1894, was as follows:

Lines.	Standard gauge.	Meter gauge.	Special gauge.	Total.
	Miles.	*Miles.*	*Miles.*	*Miles.*
State lines worked by companies	3,422¾	5,182¾	.....	8,605½
State lines worked by the State	3,876½	1,294¼	28	5,198¾
Lines worked by guaranteed companies	2,586¾	.....	.....	2,586¾
Assisted companies	183	168½	51	403¼
Lines owned by native states and worked by companies	402½	188½	71¾	662¾
Lines owned by native states and worked by State railway agency	124	¼	22¼	146¼
Lines owned and worked by native states	.....	744	94	838
Foreign lines (French and Portuguese)	.....	58¾	.....	58¾
Total	10,595½	7,637	267	18,500

Expenditure.—The total expenditure on Indian railways up to December 31, 1893, including lines under construction and survey, amounted to 2,491,296,103 [1] rupees ($1,212,386,248).

The gross earnings on all railways per mean mile worked per week were 254.38 rupees ($123.79) in 1892–93, as against 252.71 rupees ($123.37) in 1891–92.

The net earnings derived on open lines from all railways in 1892–93 gave a return per annum on total capital outlay of 5.46 per cent.

The number and value of locomotives owned by the various lines of India are as follows: Standard gauge, 2,616 locomotives, valued at 61,790,404 rupees ($30,070,300); meter gauge, 1,294 locomotives, valued at 24,560,577 rupees ($11,951,305). The total value of the rolling stock of the Indian railways is 30,061,545 rupees ($14,629,451).

Government fixes a maximum and minimum rate for freight, within which limits the roads are allowed to charge according to their discretion. From this, however, are excepted freight rates on food, grains, and coal; on these the Government reserves the right to fix freight charges.

Goods shipped by freight on Indian railways are divided into five classes. The following table shows the rate charged for each class per ton per mile, and also the fare for the first and fourth classes of passengers per mile on the principal railways:

---

[1] In the table showing the annual expenditures on Indian railways, the consul-general converted Indian currency into pounds sterling, estimating the rupee at 48.66½ cents, or ten to the pound. The Bureau of Statistics in converting the rupee has adhered to this valuation, the period of expenditures covering the twenty-three years ending December 31, 1893, although, on account of the recent depreciation in the price of silver, the rupee was valued by the United States Treasury Department on January 1, 1895, at only 21.6 cents.

Passenger fares and freight rates per ton per mile on Indian roads.

Railway.	Passenger fare per mile.		Goods rates per ton per mile.						
			Special class.		First class.	Second class.	Third class.	Fourth class.	Fifth class.
	First class.	Fourth class.	Food grains.	Coal.					
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
East Indian	13.68	1.90	2.47 to 6.89	2.07 to 3.40	6.89	10.34	3.79	17.24	20.69
Bengal-Nagpur	13.68	1.52	2.30 to 3.80	2.07 to 6.89	6.89	10.34	13.79	17.24	20.69
Indian Midland	9.12	2.03 to 2.28	2.07 to 6.89	2.07 to 6.89	6.89	10.34	13.79	17.24	20.69
Northwestern	9.12	1.52 to 1.90	2.59 to 5.17	2.07 to 6.89	6.89	10.34	13.79	17.24	20.69
Oudh and Rohilkhund	9.12	3.04	1.90 to 2.28	3.45 to 6.89	6.89	10.34	13.79	17.24	20.69
Great Indian Peninsula	9.12	1.90	2.58 to 6.13	3.43 to 3.92	6.89 to 8.26	10.34 to 10.72	15.32	19.15 to 21.45	26.05 to 30.65
Madras	9.12	1.14 to 1.90	3.06 to 6.54	2.30 to 8.26	6.89	10.34	13.79	18.39	27.58
Bengal and Northwestern	13.68	1.52	4.13 to 5.17	3.49	6.89	10.34	13.79	17.24	20.69
Rajputana-Malwa	11.40	1.52 to 1.71	2.07 to 7.14	2.07 to 4.13	7.14	10.34	14.49	18.19	20.69
Southern Mahratta	9.12	1.52 to 1.90	2.28 to 4.62	3.45 to 6.89	6.89	10.34	13.79	17.24	20.69
South Indian	9.12	1.52	6.37	6.47	6.89	10.34	13.79	17.24	20.69
Burmah	11.40	2.28	3.06 to 4.13	7.03	7.03	10.34	13.79	17.24	20.82

To give the entire classification of goods would swell this report unduly. The following articles are given, with the number of the class to which they belong: Raw cotton, pressed, 2; raw cotton, loose, 4; shellac, 2; timber, 2; iron castings, 2; brass castings, 3; kutch, 1; oil cake, 1; cheese, 3; chemicals, 2; hemp, flax, jute, etc., 1; copper, 2; cordage, 2; dyewoods, 2; imported flour, 2; glass in panes, 3; goat and sheep skins, 1; gutta percha, 3; hardware, 3; human ashes, 5; idols, 5; hides, 1; indigo, 3; kerosene oil, 2; piece goods, 2; tea, 2.

The total expenditure on State railway stores contracted for in England through the agency of the Indian office during the calendar year 1893 was as follows:

Account of expenditure	Sterling.	Equivalent in United States money.
Iron bridge work	£109,906	$534,858
Engineers' plant	34,172	166,298
Workshop machinery	6,142	29,890
Permanent way	324,336	1,578,381
Locomotive and rolling stock	185,093	900,755
Station materials and fencing	26,199	127,497
Tools and stores	91,371	444,657
Total	777,219	3,782,336

Stores purchased in Calcutta and Bombay amounted to 265,234 rupees[1] ($129,076).

The East Indian Railway.—This is a State line worked by a company. It has 1,818 miles of track, standard gauge, 475 miles being double track. It extends from Calcutta to Kalka, touching Allahabad, Cawnpore, and Delhi. At Assensol it connects with the Bengal-Nagpur road; at Jubbulpore, with the Great Indian Peninsula. The trains have vacuum brakes and are lighted with gas.

The Bengal-Nagpur Railway.—This is a State line worked by a company; system works 860 miles of road. It extends from Assensol, on the East Indian road, to Nagpur, on the Great Indian Peninsula, with a branch from Bilaspur to Katui. It is a single-track road, standard gauge.

The Indian Midland Railway.—This is a State line worked by a company; has 680 miles of road, single track, standard gauge. The center of this system is Jhausi. From here it sends out branches to Agra, where it joins the East Indian and the Rajputana-Malwa systems; to Cawnpore, where it touches the East Indian again; to Manickpur, where it connects with the East Indian, and to Itarsi, where it connects with the Great Indian Peninsula.

The Northwestern Railway.—This is a State line worked by the State; it comprises 2,450 miles. It is standard gauge and has 41 miles of double track. It extends from Kurrachee to Quetta, Peshawur, Lahore, and Delhi. It has a branch to Jammu, in Kashmir. At Ferozepore, it connects with the Rewaree-Ferozepore road; at Umballa, with the East Indian, and at Sharanpore with the Oudh and Rohilkhund road.

The Oudh and Rohilkhund road.—This is a State line worked by the State. It is standard gauge, single track, 702 miles in length. It extends from Sharanpore to Benares, on the East Indian road.

The Great Indian Peninsula Railway.—This line is worked by a guaranteed company; the system runs over 1,490 miles, of which 461 miles are double track. It is standard gauge. Bombay is the center of the system. It has a branch running northeast which connects with the East Indian at Jubbulpore. To the south it extends to Raichur, where it connects with the Madras Railway. A branch connects with the Bengal-Nagpur at Nagpur. At Poona and at Hotgi it connects with the Southern Mahratta; at Wadi it connects with the Nizanis Railway.

The Madras Railway.—This line is worked by a guaranteed company; it is standard gauge. It runs over 839 miles, of which 42 miles are double track. It runs from Madras, on the East Coast, across the Peninsula to Calicut, on the West Coast. It has a branch north to Raichur, where it connects with the Great Indian Peninsula.

---

[1] The rupee is supposed to be equivalent to 2 shillings, or one-tenth of a pound sterling. Rx is 10 rupees, or, conventionally, a pound sterling. The pice is the one hundred and ninety-second part of a rupee.

The Bengal and Northwestern Railway.—This is a State line worked by a company. It is a meter-gauge road (39.37 inches). The system comprises 756 miles, single track. It runs from Semaria Ghat to Narainganj, with branches to Khunwa and Bettiah. It connects with the East Indian Railway and the Eastern Bengal Railway.

The Rajputana-Malwa Railway.—This is a meter-gauge line. It is a State line worked by a company. The system has 1,674 miles, single track. It extends from Ahmedabad to Agra, where it connects with the East Indian. A branch taps the Great Indian Peninsula road at Khandwa.

The Southern Mahratta Railway.—This is a meter-gauge State line worked by a company. It has 1,512 miles, single track. It extends from Poona, on the Great Indian Peninsula road, near Bombay, to the Portuguese territory of Goa; thence to Bezwada. near the East Coast, crossing the Madras Railway at Guntakal.

The South Indian Railway.—This is a meter-gauge State line worked by a company. It has 1,050 miles single track. It runs from Tuticorin, in the extreme south of India, to Madras and to Neltore, on the Gulf of Bengal, and to Dharnavarani, where it connects with the Southern Mahratta.

The Burmah State Railway.—This is a State line, meter gauge, worked by the State. It has 725 miles of road, of which 9 miles are double track. It runs from Rangoon to Wintho, passing by Mandalay. There is a branch to Prome. The other Indian lines are short.

INDIAN RAILWAYS ACT.

Inspectors.—There are certain provisions in the Indian railways act (which applies to all railways in India or Burmah) which may be of interest. The act provides that the governor-general in council may appoint persons to be inspectors of railways. Each inspector, in order to perform his duties, shall have the following powers: (1) To enter upon and inspect any railway or any rolling stock used thereon; (2) by an order, in writing, under his hand, addressed to the railway administration, to require the attendance before him of any railway servant, and to require answers or returns to such inquiries as he thinks fit to make from such railway servant or from the railway administration; (3) to require the production of any book or document belonging to or in the possession or control of any railway administration (except a communication between a railway company and its legal advisers) which it appears to him to be necessary to inspect.

The duties of the inspectors are to see that the line, rolling stock, buildings, etc., are in conformity to the law as provided.

For the purpose of supervising and regulating traffic, the governor-general in council shall, as occasion may require, appoint a commission consisting of a judge of the high court and two lay commissioners, one of them at least being of experience in railway business. In hearing

any case referred to them the commissioners shall have all the powers which may be exercised in the hearing of an original civil suit by the high court, and the final order in the case shall be by way of injunction and not otherwise.

An appeal shall not lie from any order of the commissioners upon any question of fact on which two of the commissioners are agreed. Subject to this provision, an appeal shall lie to the high court. The appeal must be presented within six months. Notwithstanding the appeal, the order of the commissioners shall continue in force until it is reversed or varied by order of the high court. When it has been proven that an order of the court has not been obeyed, the court may order the party so disobeying to pay a sum not exceeding 10 rupees ($4.866) for every day during which the injunction is disobeyed. An order of the commissioners shall be final except in certain cases provided for in the act. As a matter of practice, a necessity for the appointment of the members of this commission has not yet arisen, the powers of the director-general of railways, the other provisions of the act, and the annual conferences of railway men having sufficed to settle all disputes which have arisen so far.

Traffic facilities.—Every railway administration shall, according to its powers, afford all reasonable facilities for the receiving, forwarding, and delivery of traffic upon and from the several railways belonging to or worked by it, and for the return of rolling stock. A railway administration shall not make or give any undue or unreasonable preference or advantage to or in favor of any particular person or railway administration or any particular description of traffic in any respect whatsoever, or subject any particular person or railway administration or any particular description of traffic to any undue or unreasonable prejudice or disadvantage in any respect whatsoever. A railway administration working railways which form part of a continuous line of railway communication, or having its terminus or station within 1 mile of the terminus or station of another railway, shall afford all due and reasonable facilities for the receiving and forwarding by one of such railways of all the traffic arriving by the other at such terminus or station without unreasonable delay and without any such preference, or advantage, or prejudice, or disadvantage as aforesaid, and so that no obstruction may be offered to the public using such railways as a continuous line of communication, and so that all reasonable accommodation may, by means of such railways, be at all times afforded to the public in that behalf. The act goes on to prescribe that due notice shall be given by the railway administration requiring the traffic to be forwarded, and to provide for the apportionment between the railways of the total of freight paid.

Whenever it is shown that a railway charges one trader or class of traders, or the traders in any local area, lower rates for the same or similar freight, or lower rates for the same or similar services, than it

charges to other classes of traders, or to the traders in another local area, the burden of proving that such lower charge does not amount to an undue preference shall lie on the railway. A railway may charge reasonable terminals; in case of dispute the commissioners are to decide what are reasonable terminals. In deciding the question or dispute the commissioners shall have regard only to the expenditure reasonably necessary to provide the accommodation in respect of which the terminals are charged, irrespective of the outlay which may have been actually incurred by the railway in providing that accommodation.

At every station at which a railway company quotes a rate to any other station for the carriage of traffic, other than passengers' baggage, the railway servant appointed by the company to quote the rate shall, at the request of any person, show to him at all reasonable hours, and without payment of any fee, the rate books or other documents in which the rate is authorized by the company or companies concerned.

Where any charge is made by and paid to a railway company in respect of the carriage of goods over its railway, the company shall, on the application of the person by whom or on whose account the charge has been paid, render to the applicant an account showing how much of the charge comes under each of the following heads, namely: The carriage of the goods on the railway, terminals, demurrage and collection, delivering, and other expenses, but without particularizing the several items of which the charge under each head consists. Every railway administration shall, in forms to be prescribed by the Government, prepare half yearly, or at such intervals as the Government may prescribe, such returns of its capital and revenue transactions and of its traffic as the Government may require, and shall forward a copy of such returns to the Government as it may direct.

No railway administration is allowed to charge a greater sum for a less than for a longer haul over the same line, though, under certain conditions, an equal sum may be charged for a shorter and for a longer haul, the advisability of such extra rate per mile having been shown to the satisfaction of the director-general of railways.

Rate wars rarely arise. When they do, the matter is at once taken in hand by the Government and settled in the best interests of the general public.

GOVERNMENT OWNERSHIP.

It will be but a few years before all the railways will be in the hands of the Government, according to the provisions of their charters.

The objections to the ownership of railways by the Government, as exemplified in India, seem to be the very deliberate speed at which the mileage is increased, the slowness of the service, and a more expensive way of doing work which naturally attends the action of Government officials, and which is quite noticeable when compared with the energy and push of corporation officials, driven by competition and the clamor of shareholders for more and larger dividends. On the other hand,

there are many recommendations in favor of the system and very great benefits apparent in it. First and foremost, railways are not built unless they are needed and the tributary country can support them without suffering. No parallel lines are built or commenced for stock-jobbing purposes.

Stock is not watered to rob the public by concealing the amount of interest earned on capital invested, and bonds are not issued to destroy the capital of stockholders. The capital stock can only be increased or bonds placed on the road to make improvements which the Government officials have decided to be necessary. The proceeds of the bonds or other indebtedness are accounted for and the transaction is published in the report of the director-general, where it is open and available to the general public. The railways are looked upon as public works, built for the public benefit by the aid of the powers of the Government. They are intended to be so used, and any increase of revenue arising from increased traffic or greater economy in working inures to the benefit of the public in the reduction of rates, in an increase of mileage, or in an improved service. A reasonable interest on their investment is held to be a just compensation for the shareholders, who are absolutely prevented from increasing their profits by fictitiously increasing their capital interest by watering the stock or by making themselves gifts of bonds for which no money has been paid. This result is obtained, first, by the very high standard which characterizes the official conduct of the civil-service officials who govern India, and, in the second place, by the enforced publicity which attends every act of the railway officials, through the very full and frequent reports of all their transactions which they have to furnish, and which are published by the Government, after having been put in such plain and practical shape that a person with the least amount of technical knowledge can understand them.

ACKNOWLEDGMENTS.

I take great pleasure in acknowledging my indebtedness for information to the able annual report of Lieut. Col. W. S. S. Bisset, C. I. E., R. E., and to the very interesting volume of Horace Bell, esq., M. Inst. C. E., consulting engineer for State railways, entitled "Railway Policy in India."

OCEAN STEAMSHIP LINES.

Calcutta has connections in all directions by steamship lines. The principal companies are the Peninsular and Oriental Steam Navigation Company, the Anchor Line, the Compagnie des Messageries Maritimes, the Indo-China and Apcar lines, the British India Steam Navigation, the Clan Line, etc.

Peninsular and Oriental Line.—This line has fortnightly sailings from Calcutta to London, via Colombo, Aden, Port Said, Marseilles, and Plymouth. At Colombo connection is made with their ships for China

and the East generally. First-class fare to London, 750 rupees ($365).[1] The ships are about 4,000 tons.

Clan Line.—This line runs a fortnightly service between Calcutta and London, via Madras, Colombo, Suez, and Malta. Ships about 4,000 tons burden. First-class fare to London, 600 rupees ($292).

Messageries Maritimes.—A ship of this line is run once a month between Calcutta and Colombo. At the latter port connection is made with the ships of the main line between Marseilles and China. First-class fare to Marseilles, 700 rupees ($341).

Anchor Line.—This line has a fortnightly service between Calcutta, London, and Glasgow, and connects at Glasgow with ships of its own leaving for New York. When trade justifies it, a ship is frequently sent direct to some port in the United States. The ships run from 3,000 to 4,000 tons. First-class fare to London, 600 rupees ($292).

Asiatic Steam Navigation Company.—This company runs a weekly line to Burmah, a fortnightly line to coast ports and Bombay, and has a regular mail survice to the Andaman Islands, calling at Madras and Rangoon, every six weeks. First-class fare to Rangoon, 75 rupees ($36.50); via Andamans, 104 rupees ($48.66).

British India Steam Navigation Company.—This company sends a ship every two weeks to Madras, Colombo, Aden, Suez, Naples, Plymouth, and London; to Australian ports every six weeks; to Mauritius, with transshipment to Natal and Cape colonies, every four weeks. First-class fare to London, 625 rupees ($304); to Melbourne and Sydney, 400 rupees ($195).

City line of steamers.—Regular fortnightly service, Calcutta to London, via Colombo, Perim, Port Said, Suez, and Malta. Only first-class passengers carried. Fare, 600 rupees ($292).

Indo-China and Apcar lines.—Calcutta to Hongkong, sailing every week; first-class fare, 250 rupees ($122).

---

[1] Attention is again called to the fact that rupees are converted into dollars at the rate of 48.665 cents per rupee, as was done by the consul-general in the first part of this report, while the United States Treasury Department valued the rupee on January 1, 1895, at 21.6 cents.

Freights, of course, vary with supply and demand; at present they are to different points as follows:

Class of goods.	Unit.	To London.		To Liverpool.	
		Via Canal.	Via Cape.	Via Canal.	Via Cape.
Sugar	20 hundredweight	$3.04	Nominal	$4.27	Nominal.
Saltpeter	do	3.04	do	4.27	Do.
Wheat	do	3.65	do	4.27	Do.
Rice	do	3.65	do	4.27	Do.
Linseed	do	4.25	do	4.86	Do.
Rape seed	do	5.47	do	Nominal	Do.
Poppy and teel seeds	do	6.08	do	do	Do.
Cutch in boxes	do	7.30	do	do	Do.
Jute	5 barrels of 52 cubic feet	5.47	do	5.47	Do.
Tobacco	do	5.47	do	Nominal	Do.
Cotton	50 cubic feet	5.47	do	6.08	Do.
Safflower	5 barrels of 50 cubic feet		do	6.08	Do.
Hides	14 hundredweight	12.16	$7.30	6.08	Do.
Tea	50 cubic feet	9.13	Nominal	6.08	Do.
Shellac and lac dye	do	7.30	do	6.08	Do.
Indigo	do	18.25	do	6.08	Do.
Silk	10 hundredweight	9.73	do	6.08	Do.
Castor oil	20 hundredweight	7.30	do	7.90	Do.
Turmeric	16 hundredweight	6.68	do	Nominal	Do.
Gunnies		6.68	do	7.30	Do.

To Boston.—Saltpeter, nominal; seeds and indigo, $6 per ton.

To Australia.—Gunnies, $6.08 per ton.

To Bombay.—Dead weight, $4.38 per ton; measurement goods, $9.73 per ton.

To Colombo and Galle.—Rice and grain, $2.43 per bag; measurement goods, $7.30 per ton.

To Mauritius.—Rice, grain, etc., $2.43 per bag.

To Port Natal.—Rice and grain, $11.15 per ton.

To the Clyde.—Jute, $6.52 per ton.

To Hamburg.—Dead weight, $6.52 per ton; linseed and measurement, $7 per ton.

Marseilles and Genoa.—Measurement and seed, dead weight, $6.52 per ton; light freight, $10.33 to $12.17 per ton; poppy seed, $7.90 per ton.

West Indies.—Rice and other grain, $8.56 per ton.

Sailing vessels are now chartering at about $5 per ton for United States ports, a great increase over a few months ago.

VAN LEER POLK,
Consul-General.

CALCUTTA, *November 29, 1894.*

WESTERN INDIA—BOMBAY.

OCEAN LINES.

British India Steam Navigation Company.—The following are the terminal points, taking Bombay as the central point: Bagdad, Zanzibar (African coast), Mauritius, London, Sydney, and Melbourne.

The main points touched on the Bombay-London route are Aden, Suez, Port Said, Malta or Naples, and Gibraltar; on the Bombay-Bagdad line, Kurrachee, Muscat, Bushire, Bassourah, and Bagdad; on the Bombay-Zanzibar line, Aden, Lamu, and Mombasa (African coast), and

Zanzibar; on the Bombay-Australian line, Colombo, Calcutta, Singapore, Batavia, Bushank, New Castle, Sydney, Melbourne, and Adelaide. Steamers run direct from Bombay to Mauritius Island.

The following points on the Indian coast are touched by the company's coasting steamers: Bombay northward to Kurrachee; southward to Mangolore, Tellicherry, Calicut, Cochin, Alleppey, Tuticorin, Colombo (north or east coast), Galle, Trincomalee, Negapatam, Pondicherry, Madras, Coconada, Bimlipatam, Gopaulpore, Flasepoint, and Calcutta.

The total length of the line is about 36,000 miles, and its general condition is all that can be desired.

This company has one hundred vessels, ranging from 244 to 5,450 gross tons. The nominal horsepower ranges from 90 to 700, according to the size of the steamer.

Frequency of communication: Bombay to Madras, Calcutta, Rangoon, etc., weekly (at Calcutta connect with steamer for Australia, New Zealand, and Tasmania, service monthly; at Madras connect with steamers for Penang, Singapore, etc., every two weeks); Bombay to Kurrachee, three steamers per week nine months of the year, two steamers per week for three months; Bombay to points on Persian and Arabian coast, Persian Gulf, weekly; Bombay to Zanzibar, monthly; Bombay to Mauritius, monthly; Bombay to London, via Kurrachee and Aden, every week.

Anchor Line.—Terminal points, Bombay and Liverpool; intermediate points touched, Aden, Ismailia, Port Said, and Gibraltar. Goods and passengers for the United States are transshipped at Liverpool or Gibraltar. Length of line, about 10,000 miles. Condition of the line. very good, nearly all the steamers being newly built. The fleet consists of seventeen steamers, ranging from 3,000 to 4,500 tons, and the nominal horsepower is 1,350 to 3,000, according to the size of the steamer. Communication, fortnightly.

Peninsular and Oriental Steam Navigation Company.—This company has a monopoly of the passenger traffic between Bombay and England and between Bombay and China. The termini are London, Shanghai, Yokohama, Melbourne, and Sydney. The main points touched from Bombay to London are Aden, Suez, Ismailia, Port Said, Brindisi, Malta, and Gibraltar. In the East the main points touched are Colombo, Penang, Singapore, Hongong, Shanghai, Hiogo, Nagasaki, and Yokohama. In the route to Australia the main points touched are Colombo, King George Sound, Adelaide, Melbourne, and Sydney. Connecting steamers are run to Genoa, Naples, Marseilles, and Alexandria. The line is in the best condition, being the great mail line between the East and England. The fleet consists of forty-nine vessels, with a total registered tonnage of 208,384 and a total effective horsepower of 213,550. Out of this fleet about twelve steamers are constantly in use on the Bombay line, so that the same steamer may not run twice

on the same route in one year; hence, figures as to the tonnage and horsepower on the Bombay line can not be given. The mail steamers can attain a speed of 15 to 19½ knots and the cargo steamers 10 to 14 knots per hour.

Communication from Bombay to London, and vice versa, weekly; Bombay to China and Japan, and vice versa, fortnightly; Bombay to Australia by China and Japan mail steamer, change at Colombo, fortnightly.

Florio and Rubattino United Steamship Company.—Termini: Venice and Genoa, Bombay and Hongkong. Main points touched: Homeward route, Aden, Suez, Port Said, Alexandria, Messina, Naples, and Genoa; eastward route, Colombo, Penang, Singapore, and Hongkong. The condition of the Bombay-Genoa line is very good, but the condition of the China-Bombay line is not so good. Three steamers are used for the Bombay-Genoa line, each having a net registered tonnage of 3,044 tons and 400 nominal horsepower, which attain a speed of 13 knots. There are two steamers on the Bombay-China line, each with a net registered tonnage of 1,650 tons and 200 nominal horsepower, which attain a speed of 10 knots. On both lines communication is monthly. Passengers and freight can be transshipped at Genoa for Buenos Ayres, St. Vincent, and Montevideo; service fortnightly. Freight for New York can also be transshipped at Genoa.

Austrian Lloyds Steam Navigation Company.—Termini: Trieste, Shanghai, and Kobe. Tickets can be bought for London, the passenger going by rail from Trieste or Brindisi to London. Intermediate points touched on the homeward route: Aden, Suez, Ismailia, Port Said, Brindisi, and Trieste; on the eastward route: Colombo, Penang, Singapore, Hongkong, Shanghai, and Kobe. The condition of the line is very good. It carries the Austrian mails. There are two steamers on the line from Bombay to Trieste, and five on the line from Kobe to Trieste, via Bombay. On the Bombay-Trieste line each steamer has a gross tonnage of 4,194 tons, and is 390 feet long. On the Kobe-Trieste line (via Bombay) each steamer has a gross tonnage of 4,400 tons. The steamers attain a speed of 13 knots per hour. The service on both lines is monthly.

Hall Line.—Termini: Bombay and Liverpool. Points touched en route are Kurrachee, Aden, Suez, Ismailia, Port Said, Marseilles, and Gibraltar. The length of the line is about 7,000 miles. The general condition of the line is good. The fleet consists of twelve steamers, plying between Bombay and London; tonnage of the steamers ranges from 3,000 to 4,100 gross tons, and nominal horsepower 400 to 500.

Messageries Maritimes.—Termini: Bombay, Marseilles, and Zanzibar. Main points touched en route to Marseilles are Kurrachee, Aden, Port Said, Suez, and Marseilles; en route to Zanzibar, Kurrachee, Aden, and Zanzibar. The steamers have a tonnage of from 2,300 to 4,200 gross tons and a horsepower of 2,000 to 3,400. Frequency of com-

munication: Bombay to Marseilles, monthly; Bombay to Zanzibar, monthly.

Japan Steamship Company.—Bombay and Kobe are the terminal points of the line, and the main points touched are Tuticorin, Colombo, Penang, Singapore, Hongkong, and Shanghai. The total length of the line is 5,340 miles. The general condition of the line is good. Four steamers are used and two held in reserve. The vessels have a tonnage of from 3,030 to 3,564 tons, and the horsepower ranges from 220 to 350. Communication, fortnightly.

Rates of first-class passage from Bombay.

To—	Lines.						
	Anchor.	Austrian Lloyds.	British-Indo Steam Navigation Company.	Florio-Rubattino.	Messageries.	Hall.	Peninsular and Oriental Steam Navigation Company.
Westward:							
Aden	$53.43	$54.75	$48.59	$59.35	$67.46	$53.23	$76.92
Suez	93.12	113.35	.....	95.07	147.92	119.75	169.39
Port Said	93.12	119.82	148.44	97.68	147.92	133.28	169.39
Brindisi, Malta, and Gibraltar	146.34	161.93	.....	148.43	.....	.....	185.76
Trieste	.....	161.93	.....	.....	.....	.....	.....
Marseilles	146.34	.....	.....	148.43	186.00	149.58	185.76
London and Plymouth	*a* 186.27	*a* 210.52	195.85	.....	.....	186.26	*a* 202.30
Liverpool	155.77	.....	.....	.....	.....	159.66	.....
Hull	.....	.....	.....	.....	.....	.....	.....
Boston or New York	186.27	.....	.....	.....	.....	.....	244.16
Eastward:							
Colombo	21.56	32.17	26.98	21.56	.....	.....	26.98
Calcutta	.....	.....	60.97	.....	.....	.....	59.35
Penang and Singapore	.....	62.04	.....	.....	.....	.....	80.95
Hongkong	.....	94.41	.....	.....	.....	.....	113.58
Shanghai and Yokohama	.....	121.47	.....	.....	.....	.....	134.94
King George Sound	.....	.....	.....	.....	.....	.....	113.34
Melbourne and Sydney	.....	.....	168.92	.....	.....	.....	128.16

a Bombay to Brindisi by sea and thence to London by rail.

NOTE.—First-class passage by the Wilson Line from Bombay to Hull, $145.98, and to Boston or New York, $194.64.

First-class passage by the Japan Line from Bombay to Colombo, $13.47; Penang and Singapore $32.37; Honkong, $74.17; Shanghai, $80.95; Kobe, $86.59.

Distances between Bombay and London, Bombay and China and Japan, and Bombay and Australia, and intermediate points, in miles.

From—	To— Plymouth.	Gibraltar.	Marseilles.	Malta.	Naples.	Brindisi.	Alexandria.	Port Said.	Ismailia.	Aden.	Bombay.	Colombo.	Madras.	Calcutta. Via Madras.	Calcutta. Omitting Madras.	Penang.	Singapore.	Hongkong.	Shanghai.	Nagasaki.	Hiogo.	Yokohama.	King George Sound.	Adelaide.	Melbourne.	Sydney.
London: *a*																										
Direct	295	1,299	1,993	2,280	2,272	2,640	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
By sea, direct	.....	.....	.....	.....	.....	.....	.....	3,215	3,258	4,610	6,274	6,703	7,313	8,083	7,967	7,981	8,362	9,699	10,669	10,866	11,255	11,601	10,093	11,100	11,585	12,145
By sea, via Naples	.....	.....	.....	.....	.....	.....	.....	3,382	3,425	4,777	6,441	6,870	7,480	8,250	8,134	8,148	8,529	9,966	10,836	11,033	11,422	11,768	10,260	11,267	11,752	12,312
By sea, via Marseilles	.....	.....	.....	.....	.....	.....	.....	3,501	3,544	4,896	6,560	6,989	7,599	8,369	8,253	8,267	8,648	10,085	10,955	11,152	11,541	11,887	10,379	11,386	11,871	12,431
Via Brindisi	.....	.....	.....	.....	.....	.....	3,465	3,570	3,613	4,965	6,629	7,058	7,668	8,438	8,322	8,336	8,717	10,154	11,024	11,221	11,610	11,956	10,448	11,455	11,940	12,500
Plymouth:																										
Direct	.....	1,054	1,748	2,035	2,027	2,365	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Via Brindisi	.....	.....	.....	.....	.....	.....	3,220	3,325	3,368	4,720	6,384	6,813	7,423	8,193	8,077	8,091	8,472	9,909	10,779	10,976	11,365	11,711	10,203	11,210	11,695	12,255
Gibraltar:																										
Direct	.....	.....	694	981	973	1,341	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Via Brindisi	.....	.....	.....	.....	.....	.....	2,166	2,271	2,314	3,666	5,330	5,759	6,369	7,139	7,023	7,037	7,418	8,855	9,725	9,922	10,311	10,657	9,149	10,156	10,641	11,201
Marseilles	.....	.....	.....	.....	468	.....	.....	1,508	1,551	2,903	4,567	4,996	5,606	6,376	6,260	6,274	6,655	8,092	8,962	9,159	9,548	9,894	8,386	9,393	9,878	10,438
Genoa	.....	.....	.....	.....	336	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta:																										
Direct	.....	.....	.....	.....	327	360	819	935	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Via Brindisi	.....	.....	.....	.....	.....	.....	1,185	1,290	1,333	2,685	4,349	4,778	5,388	6,158	6,042	6,056	6,437	7,874	8,744	8,941	9,330	9,676	8,168	9,175	9,660	10,220
Naples	.....	.....	.....	.....	.....	.....	993	1,110	1,153	2,505	4,169	4,598	5,208	5,978	5,862	5,876	6,257	7,694	8,564	8,761	9,150	9,496	7,988	8,995	9,480	10,040
Brindisi	.....	.....	.....	.....	.....	.....	825	930	973	2,325	3,989	4,418	5,028	5,798	5,682	5,696	6,077	7,514	8,384	8,581	8,970	9,316	7,808	8,815	9,300	9,860
Alexandria	.....	.....	.....	.....	.....	.....	.....	155	198	1,550	3,214	3,643	4,253	5,023	4,907	4,921	5,302	6,739	7,609	7,806	8,195	8,541	7,033	8,040	8,525	9,085
Port Said	.....	.....	.....	.....	.....	.....	.....	.....	43	1,395	3,059	3,488	4,098	4,868	4,752	4,766	5,147	6,584	7,454	7,651	8,040	8,386	6,878	7,885	8,370	8,930
Ismailia	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,352	8,016	3,445	4,055	4,325	4,709	4,723	5,104	6,541	7,411	7,608	7,997	8,343	6,835	7,842	8,327	8,887
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,664	2,093	2,703	3,473	3,357	3,371	3,752	5,189	6,059	6,256	6,645	6,991	5,483	6,490	6,975	7,535
Bombay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	875	1,485	2,255	2,139	2,153	2,534	3,971	4,841	5,038	5,427	5,773	4,265	5,272	5,757	6,317
Colombo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	610	1,380	1,264	1,278	1,659	3,096	3,966	4,163	4,552	4,898	3,390	4,397	4,882	5,442
Madras:																										
Direct	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	770	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Via Colombo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,888	2,269	3,706	4,576	4,773	5,162	5,508	4.000	5,007	5,492	6,052
Calcutta, via Colombo:																										
Calling at Madras	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,658	3,039	4,476	5,346	5,543	5,932	6,278	4,770	5,777	6,262	6,822
Omitting Madras	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,542	2,923	4,360	5,230	5,427	5,816	6,162	4,654	5,661	6,146	6,706
Penang:																										
Direct	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	381	1,818	3,688	2,885	3,274	3,620	.....	.....	.....	.....
Via Colombo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,668	5,675	6,160	6,720
Singapore:																										
Direct	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,437	2,307	2,504	2,893	3,239	.....	.....	.....	.....
Via Colombo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,049	6,056	6,541	7,101

Hongkong:																												
Direct																				870	1,067	1,546	1,802					
Via Colombo																								6,486	7,493	7,978	8,538	
Shanghai:																												
Direct																					467	856	1,202					
Via Colombo																								7,356	8,363	8,848	9,408	
Nagasaki:																												
Direct																						589	735					
Via Colombo																								7,553	8,560	9,045	9,605	
Hiogo:																												
Direct																							346					
Via Colombo																								7,942	8,949	9,434	9,994	
Yokohama, via Colombo																								8,288	9,295	9,780	10,340	
King George Sound																									1,007	1,492	2,052	
Adelaide																										485	1,045	
Melbourne																											560	

a If via Plymouth, add 50 miles.

Distances between points on the Indian coast, in miles.

From—	To— Gopaulpore.	Calingapatam.	Bimlipatam.	Vizagapatam.	Coconada.	Masulipatam.	Madras.	Pondicherry.	Cuddalore.	Negapatan.	Galle.	Colombo.	Tuticorin.	Colachel.	Alleppey.	Cochin.	Calicut.	Tellicherry.	Cannanore.	Mangalore.	Bombay.
Rangoon	755	825	880	897	972	1,078	1,318	1,398	1,415	1,475	1,915	1,985	2,135	2,240	2,340	2,375	2,460	2,495	2,505	2,585	2,975
Calcutta	335	405	460	477	552	658	898	978	995	1,055	1,495	1,565	1,715	1,815	1,920	1,955	2,040	2,075	2,088	2,165	2,555
Gopaulpore	------	70	125	142	217	323	563	643	660	720	1,160	1,230	1,380	1,485	1,585	1,620	1,705	1,740	1,753	1,830	2,220
Calingapatam	------	------	55	72	147	253	493	573	590	650	1,090	1,160	1,310	1,415	1,515	1,550	1,635	1,670	1,683	1,760	2,150
Bimlipatam	------	------	------	17	92	198	438	518	535	595	1,035	1,105	1,255	1,360	1,460	1,495	1,580	1,615	1,628	1,705	2,095
Vizagapatam	------	------	------	------	75	181	421	501	518	578	1,018	1,088	1,238	1,343	1,443	1,478	1,563	1,598	1,611	1,688	2,078
Coconada	------	------	------	------	------	106	346	426	443	503	943	1,013	1,163	1,268	1,368	1,403	1,488	1,523	1,536	1,613	2,003
Masulipatam	------	------	------	------	------	-------	240	320	337	397	837	907	1,057	1,162	1,262	1,297	1,382	1,417	1,430	1,507	1,897
Madras	------	------	------	------	------	-------	-------	80	97	157	597	667	817	922	1,022	1,057	1,142	1,177	1,190	1,267	1,657
Pondicherry	------	------	------	------	------	------	-------	-------	17	77	517	587	737	842	942	977	1,062	1,097	1,110	1,187	1,577
Cuddalore	------	------	------	------	------	-------	-------	-------	-------	60	500	570	720	825	925	960	1,045	1,080	1,093	1,170	1,560
Negapatam	------	------	------	------	------	-------	-------	-------	-------	-------	440	510	660	765	865	900	985	1,020	1,033	1,110	1,500
Galle	------	------	------	------	------	-------	-------	-------	-------	-------	-------	70	220	325	425	460	545	580	593	670	1,060
Colombo	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	150	255	355	390	475	510	523	600	990
Tuticorin	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	105	205	240	325	360	373	450	840
Colachel	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	100	135	220	255	268	345	735
Alleppey	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	35	120	155	168	245	635
Cochin	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	85	120	133	210	600
Calicut	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	35	48	125	515
Tellicherry	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	13	90	480
Cannanore	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	77	467
Mangalore	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	390

Distances from Bombay to points on the Persian and Arabian coast, etc., in miles.

From—	To— Kurrachee.	Gwduar.	Muscat.	Jask.	Bunder Abbas.	Linga.	Bahrein.	Busheer.	Fao.	Busreh.	Bagdad.
Bombay	500	760	990	1,125	1,255	1,365	1,610	1,780	1,920	1,975	2,475
Kurrachee	.....	260	490	625	755	865	1,110	1,280	1,420	1,475	1,975
Gwduar	.....	.....	230	365	495	605	850	1,020	1,160	1,215	1,715
Muscat	.....	.....	.....	135	265	375	620	790	930	985	1,485
Jask	.....	.....	.....	.....	130	240	485	655	795	850	1,350
Bunder Abbas	.....	.....	.....	.....	.....	110	355	525	665	720	1,220
Linga	.....	.....	.....	.....	.....	.....	245	415	555	610	1,110
Bahrein	.....	.....	.....	.....	.....	.....	.....	170	310	365	865
Busheer	.....	.....	.....	.....	.....	.....	.....	.....	140	195	695
Fao	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	555
Busreh	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500

	Miles.
Bombay to Mauritus direct	2,610
Bombay to Zanzibar direct	2,200

RAILWAYS.

Two railways enter Bombay, the Great Indian Peninsula Railway and the Bombay, Baroda and Central India Railway.

Great Indian Peninsula Railway.—This line is 1,288¼ miles long. The termini are Bombay, Raichore Junction (with Madras Railway for Madras), Jubalpore Junction (with East India Railway for Calcutta), Nagpore Junction (with the Bengal-Nagpur Railway for Assensol Junction), and Poona (change here to Southern Mahratta Railway). This road, with connections, is the great mail route between Bombay, Calcutta, and Madras.

The condition of the line is good. The line is double track, except some of the minor branch roads. Passenger rates, 12 pice (1½ cents) per mile.

On the Bombay-Raichore line, in crossing a chain of mountains, the tracks are turned back on themselves, and 2 miles farther on there is a series of tunnels. The depot at the Bombay terminus cost $3,000,000.

Bombay, Baroda and Central India Railway.—This road, including the Rajputana-Malwa Railway, is 890 miles long. The termini are Bombay, Baroda, and Delhi.

Passenger rates, about 12 pice (1½ cents) per mile.

No obstacles of any importance were met in the construction of this line.

Southern Mahratta Railway.—This road is under control of the Government. The termini are Poona, on the north; Naryangod, on the south; Belgaum, on the east; Hotgi, on the northeast; Castlerock, on the west, and Kolhapur, on the northwest. The total length of the line is 1,553.21 miles. The condition of the line is good. It is single track.

The rate for first-class passengers is 12 pice (1½ cents) per mile, and freight is carried at the rate of 7.54 pice (1 cent) per ton per mile.

There were no great obstacles to be overcome in the building of the line. There are only two tunnels, and the grade there is 1 in 40.

Indian Midland Railway.—This road is under the control of the Government, though worked by a company. The termini are Agra, on the north; Cawnpore, on the northeast, Manikpur, on the east, and Itarsi Junction, on the south. At Itarsi Junction it connects with the Great Indian Peninsula Railway from Bombay. The total length of the line is 677 miles. The condition of the line is good. It is single track.

The first-class passenger rates are 12 pice (1½ cents) per mile.

The obstacles on the line were such as had to be overcome by bridging, as follows: (1) At Nurbudda, 14 spans of 150-foot and 10 spans of 60-foot girders; (2) at Betwa, 9 spans of 150-foot girders; (3) at Chumbal, 12 spans of 200-foot and 20 spans of 20-foot girders; (4) at Jumna, 10 spans of 250-foot girders; (5) at Dassau, 13 spans of 100-foot girders; (6) at Kem, 1 span of 250-foot and 12 spans of 100-foot girders.

HIGHWAYS.

There are many military roads in India, about 30 to 50 feet wide, made of stone, dirt, and gravel.

I can give no detailed information regarding roads, but they are all in good repair (more or less), and one can go from town to town in a carriage or on a bicycle with ease and comfort.

I can gather no information regarding navigable rivers and canal lines.

H. J. SOMMER, Jr.,
Consul.

BOMBAY, *September 22, 1894.*

CEYLON.

OCEAN LINES.

Peninsular and Oriental Steam Navigation Company.—To and from England, India, Australia, and Far East ports.

British India Company.—To and from England, India, Australia, Burmah, Java, and to Mauritius.

Messageries Maritimes Company.—To and from France, India, Australia, and Far East ports.

North German Lloyds Company.—To and from Germany, Great Britain, Australia, and Far East ports.

Bibbe Company.—To and from Great Britain and Rangoon.

Orient Company.—To and from England and Australia.

Ocean Steamship Company.—To and from England and Far East ports.

Henderson's Line, City Line, Clan Line, Glen Line, and Anchor Line.—To and from India and England.

Austrian Lloyds.—To and from Trieste, India, and Far East ports.

Rubattino Company.—To and from Spain and Manila.

Russian Volunteer Fleet.—To and from Vladivostok (Russia) and Indian ports.

Nipon Yuson Kaisha Steam Navigation Company (Japanese).—To and from Japan and Bombay.

Asiatic Steamship Company.—To and from Indian ports.

Deutsche-Australische Dampfschiff Gesellschaft.—To and from Europe and Australia.

Hamburg Line.—To and from Europe and Calcutta.

Ceylon Steamship Company.—Two steamers make weekly trips around the island.

Hundreds of transient (tramp) steamers to and from all parts of the world.

The total steamship tonnage of Ceylon in 1893 was: Inward, 2,789,775; outward, 2,778,775.

HIGHWAYS.

Mr. R. K. MacBride, director of public works in Ceylon (see Special Consular Reports, "Streets and Highways of Foreign Countries," 1891), stated that the extent of roads open in Ceylon in 1890 was 3,142 miles, divided as follows, viz: Metaled roads, 1,634.80 miles; graveled roads, 965.44 miles, and natural roads—i. e., roads made mostly by the traffic over them—541.90 miles.

Through the director's courtesy I now learn that the extent of roads in 1894 was: Metaled, 2,122.06; graveled, 744.03; natural, 541.82; total, 3,407 miles. And as Mr. MacBride's report in 1891 about exhausts the subject of construction, maintenance, cost, etc., I think I can not do better than refer inquiring minds to that paper; but I would add that the metaled roads of Ceylon are, up-country, 16 feet broad, exclusive of drains, though in a few localities where the traffic is uncommonly large the width is 24 feet; low-country roads are about 20 feet broad, and all are thoroughly macadamized.

RAILWAYS.

Since I reported upon Ceylon railroads in May, 1888, the extensions to Galle, 43 miles, and to Haputala, 26 miles, in the low country and mountain zones, respectively, have been opened for traffic, and a new branch line, Polgahawela to Kurunegala, 13 miles, has been built.

Regarding the extension to Galle, it probably will pay 3 per cent net upon the invested capital; but the Haputala extension has, I understand, proved, as I feared it would, unremunerative; and I respectfully

suggest, if the Government sees fit to publish this report, that the portion of my 1888 report[1] under heading "Nanuoya to Haputala—Extension" may be herein reproduced, and also as much of that report respecting physical aspects and engineering features of Ceylon railways in general as may seem desirable.

The present main lines of railway are as follows:

	Miles.
Colombo to Banderawella	163
Kandy to Matala	17
Colombo to Galle	71
Polgahawela to Kurunegala	13

These are all single-track lines, the roadway being 20 feet broad except in rock, where it is 18 feet; weight of rails, 72 pounds per yard; gauge, 5 feet 6 inches; sleepers, 9 feet 6 inches long, 10 by 5 inches square, creosoted, and completely buried for protection from the sun and rain; average distance apart, 3 feet, two additional sleepers being added for every length of rail on heavy grades. Stations on up-country lines average about 7 miles apart; on seaside line, about 2½ miles.

The Government owns and controls all the railways in Ceylon, and they are in excellent condition.

W. MOREY,
Consul.

COLOMBO, *May 16, 1895.*

RAILWAYS IN CEYLON IN 1888.

[Republished from Consular Reports, No. 95.]

There are 182½ miles of railway in operation in Ceylon, all of 5 feet 6 inches gauge, viz: Colombo to Kandy, 74½ miles; Peradeniya to Nanuoya, 58½ miles; Colombo to Kalutara, 27¾ miles; Wharf and Breakwater branch, 4¼ miles; Peradeniya to Matale, 17½ miles.

The line from Colombo to Kandy was opened for through traffic in 1867, and the Peradeniya and Nanuoya line in the following years, viz: To Gampola in 1873, to Nawalapitiya in 1874, to Talawakele in 1884, and to Nanuoya in 1885.

The line from Kandy to Matale was opened for traffic in 1880. All the railways except the Colombo and Kalutara and the Wharf and Breakwater lines (32 miles) penetrate the central province, which contains a moiety of the estates owned by European planters, whose interests they most directly subserve. These lines are owned and worked by the Government, and were built by capital borrowed in England, as also were all the other lines above enumerated. The cost of the up-country lines was 220,457 rupees per mile, which, considering that half of the money was expended when the currency was 10 rupees to the pound sterling and the remainder at 1s. 9d. per rupee, may be calculated at

---

[1] See "Railways of Ceylon in 1888," immediately following this report.

45 cents per rupee, giving a total in United States money of $99,206 per mile. This includes every item of cost, from permanent way to workshops, rolling stock, stations, etc. All are single-track lines, and the sleepers, mostly of Norway pine, creosoted, are completely buried, so as to protect them from the sun and rain.

The formation width is 20 feet, though the rock cuttings are reduced to 18 feet; weight of rails, 72 pounds per yard; gauge, 5 feet 6 inches; sleepers, 9 feet 9 inches long, 10 by 5 inches square, and 3 feet apart, except on inclines, where two are added for every length of rail.

Engineering difficulties.—The length of the Kaduganawa incline, between Rambukana and Kandy, is 12 miles, and the gradient 1 in 45, with 10-chain curves. There are ten tunnels, the longest being 365 yards. The steepest gradients are between Nawalapitiya and Nanuoya, where, in some instances, they are 1 in 44, the sharpest curves being 5 chains. The highest altitude reached is 5,300 feet above sea level, at Nanuoya, which place, measured on the map as the crow flies, is 36 miles from Rambukana, the latter being 53 miles from Colombo and 313 feet above sea level, and here the steep ascent practically begins; whereas the actual mileage traversed by the railway between Rambukana and Nanuoya is 78 miles and the rise about 5,000 feet. These figures better represent the precipitous and tortuous character of the line than anything I can write on the subject.

The branch line to Matale (17½ miles) has no marked feature except an iron girder bridge, 664 feet long, on five piers, crossing the Mahawella River, the cost of which was $65,000. The stations are about 4½ miles apart, those on the main line from Colombo to Nanuoya averaging about 6 miles apart. This line taps a worn-out coffee district, the new industry of which may be tobacco. The lines from Colombo to Kandy, from Peradeniya to Nawalapitiya, and the seaside lines, aggregating 123 miles, are now the unencumbered property of the colony, the total cost having been paid off in 1884. At the present time, however, the other up-country lines (59 miles) can scarcely be said to be working at an appreciable profit, though the general manager of railways informs me that there is likely to be an improvement in this respect this year. The section from Peradeniya to Nawalapitiya (34 miles) may be yielding upward of 3 per cent on the invested capital, but the Matale line and the extension to Nanuoya are profitless, a circumstance owing mostly to the immense cost of their construction, the districts they penetrate affording no commensurate amount of traffic for so large an outlay.

Seaside line (speed, 15 miles per hour, including stoppages).—As hereinbefore intimated, the line from Colombo to Kalutara (27¾ miles) is on the broad gauge of 5 feet 6 inches, the stations being 16 in number and averaging a little under 2 miles apart. It is devoted almost exclusively to passenger traffic, and is a stupendous structure for that purpose; nevertheless, it pays a steady profit of about 3 per cent upon

the invested capital, viz, 2,185,912 rupees, or 78,771 rupees per mile; say, in United States money, $984,660 and $35,446, respectively.

This line, running on an almost dead level, closely follows the seashore, and skirts a thickly populated country abounding in cocoanuts and other fruits and arrack, and containing several prosperous towns and villages where much handicraft work, such as carpentering, coopering, gold and silver smithing, precious-stone cutting, etc., is done. Its ultimate destination is probably Point de Galle, or perhaps farther on to Hambantota, at present an isolated place on the southeast coast, 75 miles from Galle and 147 from Colombo, but, nevertheless, if given transport facilities, the natural outlet of the present populous district of Uva. As before stated, no goods except parcels are conveyed by this seaside line, which, from its colossal character, both in permanent way and rolling stock, is fit to carry the commerce of a continent. The passenger fares amount to about 3 cents per mile for first class, 2 cents for second class, and 1 cent for third class, United States money.

The principal engineering features of this line are an iron bridge across the lagoon at Panadura, having a clear waterway of 600 feet, and another iron girder bridge across the Kalugauga (Black River) at Kalutara, 12,000 feet long, divided into two equal sections by a small island in the river. This bridge cost $300,000.

FARES AND TRAFFIC ON UP-COUNTRY LINES.

Passenger fares from Colombo to Kandy (72 miles) amount to about 4 cents per mile for first class, 3 cents for second class, and 1½ cents for third class, United States money.

The Matale line fares are about the same, but those on the Peradeniya-Nanuoya extension are 5 cents per mile for first class, 3½ cents for second class, and 1½ cents for third class, United States money. This being a purely local and domestic matter, into which the element of exchange scarcely enters, I have converted the local currency into United States currency at the rate of 45 cents per rupee; calculated on a gold basis, the amount of the fares would bear a reduction of at least another 10 per cent.

Goods are divided into three classes and charged accordingly. There are also special rates for certain products, viz, coffee, cinchona, tea, etc., mostly the products of plantations belonging to Europeans, and live stock.

The total profits earned on all the railway lines at present in operation here is about 3 per cent on the invested capital, which, it is to be feared, is not likely to be appreciably increased so long as the present expensive broad-gauge system is adhered to. Briefly stated, the broad-gauge railways of this country have, in my judgment, proved a positive incubus to the island, excepting perhaps the line to Kandy, beyond which place the system never ought to have been extended.

LINES PROJECTED AND SURVEYED.

At present there is no railway construction in progress, but the following lines have been surveyed, viz: Kandy to Badulla, 3 foot 6 inch gauge, 62½ miles, cost not estimated; Nanuoya to Haputale, 5 foot 6 inch gauge, 26 miles, $3,013,000; Mahara to Chilaw, 5 foot 6 inch gauge, 40 miles, $1,150,000; Mahara to Chilaw, 3 foot 3⅜ inch gauge, 40 miles, including mixed gauge to Colombo, $1,200,000; Kalutara to Bentota, 5 foot 6 inch gauge, 9 miles, no published particulars; Mahara to Jaffna, 183 miles, no published particulars; Mattakuliya to Colombo (tramway), 4⅙ miles, $271,000.

The first of the above named, called "Lower Badulla route," passes through a mostly barren, unhealthy, and somewhat precipitous line of country, sparsely populated, and offering few attractions to agriculturists—probably its construction is not seriously contemplated by the Government. Nevertheless, it is the most practicable route by which to tap Badulla, and thus connect the Province of Uva by rail with Colombo, besides affording the preliminary for a scheme of narrow-gauge railways across the island to the fertile districts of Batticaloa and other important places on the eastern side of the island.

Nanuoya to Haputale.—A line upon the Lartique or some other economical system could be built over the Lower Badulla route for about one-fourth, approximately, of the estimated cost, $3,013,000, of the projected broad-gauge extension of 26 miles to Haputale, which, after all, will only partially penetrate and only serve a fraction of the Province of Uva, all of the plantations of which are not likely to produce annually in the near future, for railway transport, more than 7,000 tons of produce, principally coffee, cinchona, and tea, at least one-third, perhaps one-half, of which may never seek the line in question unless it is extended another 28 miles to Badulla. The up traffic will probably not exceed 15,000 tons, which, together with a possible 7,000 tons down, gives a total of 22,000 tons, though a commission has estimated it at 27,444 tons sure, whereas even the 22,000 tons I estimate are somewhat problematical and largely dependent on future development.

As, however, this expensive extension has now been sanctioned by the Imperial Government and may very soon be in process of construction, it may be well to add that the district it will only partially penetrate contains all together about 40,000 acres, nominally under tea, cinchona, and coffee cultivation, the last-named product fast disappearing. The total inhabitants number about 170,000. Two hundred, perhaps, of these are Europeans, mostly planters, who overlook about 35,000 Tamil coolie laborers. Probably another 10,000 natives are engaged in trade, cart transport, and other miscellaneous occupations, leaving 125,000, mostly Singhalese, dependent upon native agriculture, the products of which are all consumed within the province. The climate is unexceptionable, but the arable land is not extensive and even now is almost fully occupied. That the wealth of the 125,000 people, of all

ages, engaged in native agriculture will be increased or their condition improved economically by this railway extension is more than doubtful, for, alas, past experience indicates, throughout the central provinces, the contrary. As a matter of fact, there is not an interior district of this island xcept Kandy that has been tapped or even approached by a railroad where, after ten years' experience, the natives are not much worse off than they were before, and I wish I could believe that the present project will result differently. If the intention were to continue the broad-gauge extension on to Passara as a final terminus of that system, from which cheaper and more practical lines could radiate across districts urgently requiring them, I could see some utility in the project; as it now appears, however, I see nothing in it but a mistake.

That new enterprises will be born of this extension or old ones within the province be so stimulated as to lead to a materially increased consumption of or demand for American manufactures I do not believe; nevertheless, there might be such a change in native agricultural methods as would create a demand for some of our farming implements.

Mahara to Chilaw.—Mahara is a station on the line to Kandy, 9 miles from Colombo, and Chilaw is a town or hamlet situated on the west coast of the island, 48 miles from Colombo. The intervening country, containing about 170,000 inhabitants, is flat throughout, and for upward of 30 miles from Colombo abounds in fine cinnamon and cocoanut plantations. North and east of Chilaw, in the neighborhood of Puttalam, there are fine forests of valuable timber, ebony, satinwood, etc., and the contiguous land is probably better than the average in Ceylon for agriculture. Cotton and tobacco are as likely to succeed there as anywhere else in the island, I should think, and a comparatively inexpensive line of light railway would prove a great boon and a good investment by opening up the country, for it could be continued on to Puttalam, 42 miles farther up the coast, and thence across the island, through Anuradhapura, or on to Jaffna, in the northern province, thereby effecting easy communication with that enterprising place, and affording transportation for what is likely to prove, under the revival of the ancient irrigation system, the most fruitful district in Ceylon.

The line to Chilaw (40 miles as at present surveyed) is conceived entirely in the interests of the broad-gauge system, and is estimated to cost 3,411,997 rupees, or 84,384 rupees per mile. There is also an estimate for a meter-gauge line, with a continuation of 9 miles, from Mahara to Colombo, amounting to 3,627,980 rupees, or 89,739 rupees per mile, which probably could be greatly modified. The goods traffic is estimated at 74,000 tons, which would probably be exceeded.

Kalutara to Bentota.—This will be a mere continuation for 9 miles of the seaside line already described. It could probably be built for less than 50,000 rupees per mile, but is likely to cost at least 70,000 rupees per mile.

Matale to Jaffna (183 miles).—This would connect with the present broad-gauge line at Matale, and open up communication between Colombo and Jaffna, via Kandy and Anuradhapura, involving an ascent of 1,700 feet to Kandy and a corresponding descent from Kandy to Colombo; whereas the Chilaw line, if constructed and continued on as hereinbefore suggested, would run mostly upon a level, accommodate a much greater population, and serve a larger extent of virgin country.

Colombo City Line.—The proposed tramway from Mattakkuliya to Colombo ($4\frac{1}{6}$ miles), estimated to cost 741,298 rupees, or $296,500, has remained unconsidered for years. A few days since, however, the Colombo municipal council resumed consideration of the subject.

CONCLUSION.

From all I can learn from observation and the literary annals of railways here, * * * the present penchant for expensive broad-gauge lines stops the way to that future development which ought to cover the whole country with a network of iron rails on the cheapest system that has been found to be serviceable elsewhere under similar conditions.

The country is rich in undeveloped and possible products, but financially poor. There probably is not the cash equivalent of $10,000,000 in the whole island. There is, however, notwithstanding admirable administration, which must be admitted, as much pomp and circumstance with respect to railroading, so far as it has progressed, as would serve the richest community in the world, and the mass of the people groan under it.

The total cost of the $182\frac{1}{2}$ miles in operation was, exclusive of interest, 35,924,738 rupees, or $16,166,132 in gold. It is, in my opinion, unreasonable for a people so poor in treasure to pay so much money for so little railroad, and the present railway debt, owed abroad, amounting to £1,253,000, or $6,266,000, at 4 per cent interest, should not, I think, be increased by further construction at the cost at present prevailing.

To support this proposition, I would respectfully point out that the railway debt aforesaid, bearing 4 per cent interest, is for only 59 miles of railroad, which is not yielding any appreciable profit, a state of affairs, it is to be feared, very unlikely to be remedied by building another 26 miles, at a cost of $2,750,000, to carry perhaps 22,000 tons of traffic.

Doubtless the present Government would dislike, in giving to Uva the railway facilities its European denizens have long pined and agitated for, to put an attenuated tail, or less consequential line, upon the imposing structure its predecessors have carried so far in that direction, and time only will show whether or not such a sentiment, if it does exist, is justifiable economically.

W. MOREY,
Consul.

CEYLON, *May 18, 1888.*

STRAITS SETTLEMENTS.

The Malay Peninsula, in which the consular district of Singapore is situated, lies within the wake of traffic and travel between Europe, China, and Japan. All the more important outward and homeward bound steamers engaged in this great trade put in here to coal, discharge and take on mails, passengers, and freight, and here meet connecting steamers to British India, Siam, Burmah, the Netherlands Indies, Borneo, the Philippines, and the various points along the Malayan coast.

OCEAN LINES.

The great ocean lines connecting Singapore with the European ports and those of the Far East are:

(1) Compagnie des Messageries Maritimes.
(2) Peninsular and Oriental Steam Navigation Company.
(3) Norddeutscher Lloyd.
(4) Austrian Lloyds Steam Navigation Company.
(5) Compañia Transatlantica.
(6) Deutsche Dampfschiffs Rhederei.
(7) Ocean Steamship Company.
(8) Glen Line of steam packets.
(9) Ben Line.
(10) China Mutual Steam Navigation Company, Limited.

The first five only are under regular mail contract. The following are the accessible details of the various lines:

Compagnie des Messageries Maritimes.—I am indebted to M. de Bure, the agent at Singapore, for the information herewith given concerning this line.

The Messageries Maritimes de France is constituted as a joint stock company, with a capital of 60,000,000 francs, fully paid up. The central office is situated at Paris. Another office, established at Marseilles, under the name of "Direction de l'Exploitation," regulates the working of the lines which have their headquarters in that port—India, China, and Japan line, Australia line, East Africa line, and Mediterranean and Black Sea lines. A general agency at Bordeaux manages the South American line, and a general agency is also established at London.

By a convention with the French Government, the company is in charge of the French postal service on the China, Australia, and East Africa lines, as well as on some of the Mediterranean lines. For this service the company receives a subsidy, in exchange for which certain conditions known as cassier des charges are accepted. On each steamer of the main lines a mail agent (agent des postes) takes passage. Besides his duties in connection with the receipt and delivery of mails in every port, he has also, as a "commissary of the Government," control in the working of the line with respect to the regular execution of the postal contract.

The China mail line, steamers of which call at Singapore, starts from Marseilles, calling at Alexandria, Port Said, Suez, Aden, Colombo, Singapore, Saigon, Hongkong, Shanghai, Nagasaki, and, via the Inland Sea, at Kobe and Yokohama. The passage from Marseilles to Japan is made without any transshipment and by same steamer. The steamers leave Marseilles every two weeks, on Sunday afternoon, taking mails from London dated Saturday morning and French mails dated Saturday night. At Colombo every four weeks connection is made with a steamer running to Pondicherry, Madras, and Calcutta, and at Singapore with a steamer running every fortnight to Batavia and to Samarang every twenty-eight days.

Every mail steamer connects at Saigon with the Annam and Tonkin branch line, the principal ports of which are Quinhon, Tourane, and Haiphong, the terminus.

A branch line, subsidized by the Indo-Chinese colonial government, runs between Saigon and Singapore, connecting here with every English fortnightly mail.

On the return voyage from Yokohama, the mail steamer, on arrival at Shanghai, transships to the preceding vessel her passengers, mails, and valuable cargo, and remains a fortnight there, when she leaves again homeward with the transshipment brought in by the following steamer from Japan.

The total length of the line covered from Marseilles to Yokohama is 10,135 miles, distributed between ports of call as follows:

From—	To—	Miles.	From—	To—	Miles.
Marseilles	Alexandria	1,408	Colombo	Singapore	1,570
Alexandria	Port Said	160	Singapore	Saigon	637
Port Said	Suez	87	Saigon	Hongkong	915
Suez	Aden	1,308	Hongkong	Shanghai	870
Aden	Colombo	2,095	Shanghai	Yokohama	1,085

The Colombo-Calcutta line covers 1,420 miles; and the distance from Marseilles to Calcutta is 6,478 miles. The Singapore-Batavia run is 550 miles; and the Singapore-Samarang run, 790 miles; the distance from Marseilles to Samarang being 7,418 miles. The course of the Tonkin branch line is 893 miles, and from Marseilles to Haiphong the distance is 8,158 miles.

The steamers have been, with a few exceptions, built in the company's own yards at La Ciotat, between Marseilles and Toulon. They are always kept in perfect condition and have every modern appliance to secure safety and comfort. Their rating with insurance companies is the highest and the premium on goods shipped by them is smaller than by other cargo lines.

The fleet of the company now numbers fifty-five vessels, viz:

Name.	Gross tonnage.	Horse-power.	Name.	Gross tonnage.	Horse-power.
India, China, and Japan mail line:			River Plate and Brazil line:		
Oceanien	4,259	3,400	Plata	5,676	5,400
Yarra	4,255	3,400	Bresil	5,809	5,400
Salazie	4,255	3,400	Portugal	5,430	4,800
Sydney	4,232	3,400	Equateur	3,856	2,900
Caledonien	4,232	3,400	Congo	3,832	2,900
Melbourne	4,080	3,400	Orenoque	3,831	2,900
Natal	4,070	3,400	Dordoque	3,750	2,200
Saghalien	4,050	2,900	Cargo vessels:		
Oxus	3,970	2,900	Charente	3,774	2,200
Batavia branch:			Adour	3,730	2,200
Godavery	1,480	1,600	Ortegal	3,656	1,900
Calcutta branch:			Corduan	3,679	1,900
Eridan	1,852	1,400	Matapan	3,656	1,900
Saigon-Singapore branch:			Medoc	3,655	1,000
Tibre	1,838	1,600	Mediterranean and Black Sea lines:		
Tonkin line:			Yangtse	3,791	2,900
Arethuse	1,246	1,400	Djemnah	3,785	2,900
Tamise	2,333	1,400	Traonaddy	3,785	2,900
Haiphong	1,548	1,400	Niger	3,726	2,900
Australia and New Caledonia line:			Gironde	3,260	2,900
			Senegal	3,716	2,900
Armand Behic	6,548	7,000	Tigre	3,234	1,400
Polynesien	6,562	7,000	Cambodge	2,599	1,400
Australien	6,563	7,000	Uerthe	3,718	2,900
Ville de la Ciotat	6,542	7,000	La Bourdonnais	2,045	1,600
Tanais	1,824	1,600	Alphée	1,960	1,400
East Africa line:			Erymanthe	2,095	1,400
Peiho	3,350	2,400	Manche	2,315	1,400
Amazone	3,392	2,400	Guadalquivir	2,638	1,400
Ava	3,361	2,400	Guadiana	2,632	1,400
Sindh	3,373	2,900	Douro	2,745	1,400
Branch line:					
Mysanjaka	684	450	Total*	192,101	150,150

* The following are not noted in the list: The La Seyne, of 2,353 tons and 2,000 horsepower, and two steamers of 6,000 horsepower each, in course of construction. They are to connect at Aden with the Australia and East Africa lines.

The following are the local rates of passage in Mexican dollars as charged by the Singapore agency:

From Singapore to—	First class.	Second class.	Third class.	From Singapore to—	First class.	Second class.	Third class.
Saigon	$50	$38	$20	Madras	$140	$95	$52
Hongkong	75	50	27	Calcutta	170	112	63
Shanghai	125	80	45	Aden	250	200	95
Kobe and Nagasaki	130	85	50	Suez	385	257	142
Yokohama	138	92	52	Port Said	400	262	145
Batavia	60	45	25	Alexandria	405	270	150
Samarang	90	65	40	Marseilles	440	280	157
Colombo	112	75	42	London (by mail)	470	305	.....
Pondicherry	130	87	50				

During the year 1893 the number of passengers booked at Singapore was 1,989. The general service, as well as the meals, which are of the best French style, are greatly appreciated by passengers. Each steamer carries a surgeon, and all the stewards and stewardesses are European.

Baggage is stored in a special hold and convenient of access at any time.

The first-class cabins have two or three berths, and the second-class cabins four berths. Bedding and linen are supplied to all passengers.

On the homeward voyages, from February to June, the vessels generally have full passenger lists, and also during the outward season from September to December. Freight rates are governed by the market, and are subject to frequent fluctuations, varying almost every week, so it is not possible to quote any rates from this port. The homeward freight rates are always quoted in sterling and paid here at the rate of exchange on demand on the date of shipping.

During the year 1893, 175,442 packages were shipped. The vessels generally secure full cargoes in Japan, China, and Saigon, leaving but little room available for cargo at Singapore.

Peninsular and Oriental Steam Navigation Company.—This is a private association, with ships of about the same capacity as those of the Messageries Maritimes line. They are well managed, make good time, and possess, according to those who travel upon them, all modern conveniences. The cooking, however, is not as well suited to the non-British palate as that of the French liners, and they do not, as the latter, supply passengers with wine at meals free of charge.

The Peninsular and Oriental Line is under contract with the Government of Great Britain to carry mails, and has, in conjunction with its other important lines, one between Europe, China, and Japan, the steamers of which, leaving London every fortnight for Yokohama, and vice versa, call en route at Singapore, where, by alternating with the steamers of the Messageries Maritimes, it constitutes with the latter the regular direct weekly mail service to and from this point east and west.

Norddeutscher Lloyd and Austrian Lloyd.—These lines, also subsidized by their respective Governments for mail service, have first-class modern steamers, under good management.

The route of the former is from Bremerhaven to Shanghai, and vice versa, with connections from Hongkong to Yokohama and from Singapore to the Netherlands Indies and German New Guinea, with stops at various points.

The route of the latter is from Trieste, via Port Said, Suez, Aden, Bombay, Colombo, Penang, Singapore, Hongkong, and Shanghai, to Kobe (Japan), and vice versa.

The vessels of these lines call here once a month.

Compañia Transatlantica.—The steamers of this line, subsidized by the Spanish Government, run from Barcelona to Manila and back, touching at Singapore and other points, calling here once a month. The vessels of this company are in good repute.

Other Ocean Lines.—The only other through ocean lines of importance calling here are the Deutsche Dampfschiffs Rhederei, the Ocean Steamship Company, the Glen Line of steam packets, the China Mutual Steam Navigation Company, Limited, and the Ben Line. These lines are principally freight carriers and none are under regular government contract for carrying mails.

LINES TO ADJACENT STATES AND COLONIES.

British India Steam Navigation Company, Limited.—This is an important and well-managed line, running weekly mail steamers from Singapore, via Rangoon, to Calcutta and return, with connecting steamers to Bombay, which call at the various Indian ports en route.

Koninklijke Paketraart Maatschappij.—This is a noted Dutch association, with a capital of $3,750,000, having, in addition to its other lines, first-class, well-appointed steamers running a regular passenger, mail, and freight service between Singapore and Batavia and other ports of the Netherlands Indies, as will be seen in the following very complete report by its agent here, Mr. M. G. van der Burg:

The Koninklijke Paketraart Maatschappij (Royal Packet Navigation Company) is a private company, under contract with the colonial government of Netherlands India for the conveying of Government passengers and goods, army and navy stores, etc. In case of war the steamers are to be used as Government transports. The company's capital is 6,000,000 florins, with 3,000,000 florins in bonds, a total of £750,000.

The fleet consists of thirty-one steamers, aggregating 32,488 tons. The ships are all built with a view to comfort of passengers and are fitted accordingly with roomy saloons and airy cabins, refrigerating machines, etc. They are of the awning-deck type, affording a spacious and cool quarter-deck. Fourteen are fitted with electric lights. The average speed is 10 knots, but 12 and 13 knots are attained on the main line.

The following are the regular lines in the Netherlands India Archipelago:

(1) From Batavia: Fortnightly, via Telok, Betong, Kroe, Bencoolen, Tadang, Oleh-leh (Acheen), Segli, and Edi, to Penang, and back to Batavia via the same ports, along the west coast of Sumatra. Every three months the isolated island of Engano is visited.

Every four weeks, via Telok, Betong, Kroe, Bencoolen, Padang, Priaman, Ayer, Bangies, Natal, Siboga, Baros, Singkel, Gunong, Sitolie (Nias), Truman, Tampat, Tuan, Susu, Analabu, Pulo, Raja, Oleh-leh (Acheen), Segli, Tòlok, Sewawe, Edi, Penang, and Singapore back to Batavia. The return voyage is made by a steamer leaving Batavia in the opposite direction, calling at Singapore first, where the ships meet.

(2) From Singapore every four weeks, via Penang, Oleh-leh, Pulo, Raja, Analaboe, Gunong, Sitolie, Singkel, Baros, Siboga, to Padang, and back to Singapore. At Padang and Singapore these steamers connect directly with service to Batavia.

(3) From Batavia weekly to Singapore and back, calling once every fortnight, out and home, at Muntok (island of Bangka) and Rhis, the capital of the Rhis-Luigga Archipelago, and carrying the fortnightly Peninsular and Oriental mail to and from Batavia. This line also connects with the French mail to and from Singapore.

(4) From Batavia, twice a month, via Muntok (Bangka), to Palembang (Sumatra) and back to Batavia via same places. Once every four weeks, via Muntok, Palembang, Muara Saba, and Simpang, to Djambi, and back to Batavia via same ports.

(5) From Batavia, once every fortnight, to Belawan-Deli, the tobacco district on the east coast of Sumatra, and back.

From Singapore to Deli, once a fortnight, via the tobacco district ports, Paneh, Bilah, and Asahan. Bangkalis and Siak are also called at once a month.

(6) From Batavia, once every four weeks, to Pontianak, the Dutch capital of the west coast of Borneo, calling en route, on the outward and homeward voyage, at the island of Billiton, where extensive tin mines are worked.

(7) From Batavia, once a week, via Samarang, the capital of central Java, for Sourabaya, the commercial center of the Netherlands India. The trip is made in fifty hours, including a ten-hours stop at Samarang.

From Batavia, weekly, to Sourabaya, via Cheribon, Tegal, Pecalongan, and Samarang. This trip takes sixty-eight hours, including eighteen hours' detention at the four ports touched en route.

(8) From Singapore, monthly, via the island of Bawean, Sourabaya, Benjermassin (Dutch capital of the south coast of Borneo), Pulo-Lant, and Passir, to Kutei, on the Mahakker River, the principal Dutch settlement on the east coast of Borneo, and return via the same places to Singapore.

From Singapore, every four weeks, to Benjermassin direct and farther, via Pulo-Lant, Passir, Kutei, and Donggala, to Beran and Bulongan, two sultanates under Dutch suzerainty, south of the British North Borneo Company's territory.

(9) From Batavia, every four weeks, the Moluccas line via Samarang and Sourabaya, to Macassar, the capital of the Celebes Island, where a two-days stay is made. The steamers then call at Amboina and Banda (the Spice Islands) and the islands of Buru, Batjan, and Ternate. From the latter they cross again to Celebes, calling at Gorontalo, Menado, Buol, Toli-toli, Donggala, and Pare-pare, all on the north and west coasts of Celebes, and return to Macassar after a twenty-days trip. The boats remain there two days and return to Batavia via Samarang and Sourabaya. From Macassar the voyage is begun alternately in a northerly or southerly direction, one month Amboina and the next month Pare-paro being the first port called at.

From Singapore, the intermediate Moluccas line every four weeks to Sourabaya direct and via the islands of Bali, Lombok, and Sumbawa to Macassar. From Macassar, after a two-days stay, the steamers make the round trip through the Moluccas, starting alternately in a northerly or southerly direction, calling at (southerly direction) the Spice Islands—Amboina and Banda—Buru, Batjan, and Ternate; from the last-named island they cross to Gorontalo (Gulf of Tomini, Celebes) and from Gorontalo make the Sangir Islands to the northward, calling at Siao and Taruna. They then shape a course to the southward and after calling at Menado, Kwandang, Amurang, Toli-toli, Donggala, and Pare-pare, on the north and west coasts of Celebes, Macassar is reached again after a voyage which averages twenty-two days. From Macassar the boats return to Singapore via Sumbawa, Lombok, Bali, and Sourabaya.

(10) From Macassar, every four weeks, to Bonttain, Bulecombah, Saleur, Balangnipa, Palima, and Paloppo, in the Gulf of Boni, the island of Buton, and Kendari, Tembuku, and Salabangka, on the east coast of Celebes, calling at the same ports on the homeward voyage, and also at the island of Bonerateh.

(11) From Singapore, every four weeks, the Teimor line, alternately to Sourabaya direct and to Sourabaya via Batavia and Samarang. Leaving Sourabaya, the boats call at Bali, Lombok, Macassar, Bima (Sumbawa), Nangamessie (Sandalwood Island), Eudeh (Flores), Savoo, Rottie, Timor-Kupang, Timor Dilly, Atapupu (Timor), Alor Larentuka, and Maomerie (Flores); and, via Bima and Macassar, they return to Singapore, alternately direct or via Samarang and Batavia.

(12) From Singapore, once every two months, to Sourabaya, Bali, Lombok, Macassar, Amboina, Banda, and via Gisser, Lekar, and Skroe, or New Guinea, Tual, and Dobo, on the Keh and Aru (pearling) islands, Larat, Sjerra, Tepa, Wulur, Serwaru, Kisser, and Thvaki, back to Banda; thence via the same ports the boat returns to Sourabaya and Singapore.

(14) From Amboina, once every three months, a steamer of the Moluccas New Guinea line leaves for Humboldt Bay (north coast New Guinea), via Wahaay, Ternate, Gonei, Patanie, Saonek, Sorong, Samate, Doreh, Roon, Ansoes, and Djama, and returns to Amboina via the same points. The second part of the itinerary is as follows: To longitude 141° east on the south coast of New Guinea, via Gissir, Sekar, Skroe, Tual, and Dobo, returning to Amboina by the same route.

(14) From Sourabaya, every fortnight, to Banaraskan, Banjuwangei, Boleleng (Bali), Labuan Hazi, and Pedju or Lombok, and Bima, and Sumlawa or Sumbawa, returning by the same route.

Details of the distances and freight and passage rates are too lengthy for reproduction here, and as they fluctuate would be of no value for reference.

The total number of nautical miles run by the company's boats in 1893 was 219,993, and 175,474 passengers were carried.

Through transshipment agreements with the Netherlands mail lines between Java and Amsterdam and Rotterdam, as well as with foreign steamship companies, direct connections have been established between all ports of the Netherlands Indies and all ports of the Continent of Europe, Great Britain, the Mediterranean, the Atlantic seaboard of America, British India, and Australia. Quick communication is also provided by the weekly steamers from Batavia, and frequently from Sumatra, Borneo, the Moluccas, Macassar, and Sourabaya, with Manila, Bangkok, Saigon, China and Japan ports, the Sandwich Islands, San Francisco, and Vancouver, all services being via Singapore.

Commerce in the archipelago is rapidly increasing and the number of tons of merchandise carried (imports and exports) shows a considerable increase each year. The number of tourists is also greater each season, and many merchants avail themselves of the quick and comfortable steamship accommodation now afforded to take a personal view of the field of their East India trade and establish new connections.

Ocean Steamship Company.—This company has direct steamers sailing every three days from Singapore for Bangkok (Siam), and others plying between Singapore and Saigon, and between Singapore, the Netherlands Indies, and the British North Borneo ports.

Apcar and Jardine lines.—Steamers of these lines from Hongkong to Calcutta call at Singapore both going and coming.

Sarawak and Singapore Steamship Company.—This company's shares are owned partly by the Government of Sarawak and partly by private individuals or corporations. It has a steamer running every twelve days between Singapore and Kuching, Sarawak.

COAST AND RIVER LINES.

There are numerous vessels engaged in the coasting trade of the Malay Peninsula between Singapore and Penang, which call at the intermediate ports of Malacca, the Dindings, Port Dickson, and Port

Wells, and also proceed up the different navigable streams to such points as Klang, on the river of that name, in the State of Selangor; to Telok Anson, on the Perak River, in the State of Perak, and farther when high water permits; and also to a considerable distance up the Maur River, in the territory of the Sultan of Johore. The principal line in this trade is the Straits Steamship Company, Limited, which has regular first-class mail steamers doing coastwise service and plying between these settlements and the islands adjacent.

In addition to the preceding, there are numerous other steamers engaged in the ocean, intercolonial, and coasting traffic which put in at Singapore, but it is unnecessary to mention them, for the reason that they do no regular service and are principally freight vessels.

HOW TO REACH SINGAPORE FROM THE UNITED STATES.

There are two routes by which to reach Singapore from the United States, the Pacific route and the Atlantic route. The first is by way of San Francisco, either direct or via Honolulu, to Yokohama, and thence by way of Shanghai, Hongkong, and Saigon. The second is from New York to Europe and by way of the Suez Canal and Colombo. Proceeding from our western seaboard, the former is the most expeditious; proceeding from our eastern seaboard, the latter.

ROADS AND RAILWAYS.

There is a complete system of macadamized roads throughout the colony of the Straits Settlements, and there are a number of good roads constructed and more in course of construction in the contiguous native States of the Malay Peninsula.

In the Singapore district there are 85 miles of road within and 75 miles without municipal limits. Of these the first-class roads are from 40 to 60 feet in width, the ordinary roads 30 feet, and the minor roads 20 feet.

In Malacca there are 205½ miles of first-class and 123½ miles of second-class roads.

In Selangor there are of the metaled cart roads 135.37 miles; of graveled cart roads, 28.71 miles; of natural roads, 192.52 miles, and of bridle roads and paths, 57 miles; a total of 413.60 miles. The roads have an average width of 18 feet.

In Sungie Ujong and Jelebu the roads have an average width of 16 feet, and their total length is 92 miles.

In Perak there are of metaled cart roads 260 miles; of unmetaled cart roads, 114 miles, and of bridle paths, 364 miles; a total of 738 miles. The average width of these roads is 16 to 18 feet.

In the Straits Settlements proper there are no railways; those constructed or in course of construction are in the native protected States of the Malay Peninsula.

E. SPENCER PRATT,
Consul-General.

SINGAPORE, *December 26, 1894.*

MALAY STATES.

INTRODUCTORY.

In presenting this special report on the railways of the Malay Peninsula, I wish to state that, for the information contained herein, I am indebted to the courtesy of the British residents in Selangor, in Perak, and in Sungie Ujong and Jelebu, who, in response to my interrogatories, caused the government engineers and superintendents of works and surveys in their respective States to supply the data, which I could not otherwise have obtained.

There are no railways in the Straits Settlements proper. Those in the adjacent native States of the Malay Peninsula, excepting a purely local freight line of 8 miles between Bandar Maharanee, on the Maur River, and Perit Jawa, both in the Sultan of Johore's province of Maur, are confined to Selangor, Perak, Sungie Ujong, and Jelebu. Of these full particulars are given under their respective headings.

SELANGOR RAILWAYS.

The Selangor Government Railway is a 1-meter gauge (39.37-inch) single-track line, of which there are at present 63 miles open for traffic. The original scheme, which was to connect the large tin-mining district, of which Kwala Lumpur, the capital of the State, is the center, with the coast, was inaugurated in September, 1886, when the line from Kuala Lumpur to Bukit Kuda, a point on the Klang River 12½ miles from its mouth, was opened for traffic by Sir Frederick Weld, governor of the Straits Settlements.

The Klang River is one of the two principal rivers flowing through the State into the Straits of Malacca, and it drains an extensive valley, the higher parts of which are rich in alluvial tin. The river throughout its course, running as it does through an extremely flat country, is very tortuous, and it was soon found that the port at Bukit Kuda, which had been established as a purely temporary measure, was, from its position and the difficulties of navigating the river in approaching it, an undesirable permanent terminus for the railway.

In 1887 the government of the State had seriously brought before it the necessity of extending the railway to a point farther down the river, which would be easier of approach than the point originally selected as a temporary terminus. After due consideration, the township of Klang, standing on the left bank of the river, 9½ miles from its mouth, was selected as a suitable and convenient site for a port and terminus for the railway. This extension of the railway was accordingly built, and was opened for traffic in August, 1890.

At the time of the selection of Klang as a terminus and port it was considered that the available accommodation there would be sufficient

for many years to come; but the abnormal increase in the imports and exports of the State, and consequently in the traffic carried by the railway, made it necessary to again consider the question of terminus, and it was decided early in the present year to extend the railway to the mouth of the river. Here it is proposed to construct commodious iron wharves, capable of such extension as the trade of the State may demand.

The site of the proposed harbor is on the estuary of the Klang River where it debouches into the Klang Straits; it is completely landlocked and affords excellent anchorage ground for ships of large draft. The bottom consists entirely of alluvial mud, and there are no reefs or shallows in the approach or in the harbor itself, and, owing to the estuary, there is no bar on the river. In fact, the island known as Pulau Klang, lying at the mouth of the estuary, probably formed at some remote period the river bar. At the present time, however, there are two deep-water channels, one on each side of the island, by means of which vessels may enter or leave the port at all states of the tide. It is customary for coasting vessels trading with the ports on the western shore of the peninsula to use these channels in preference to keeping out to sea.

It is proposed to construct the wharves in a position which will give a depth of water alongside varying from 13 to 17 feet at low water, ordinary spring tides. There is a rise and fall of tide of approximately 14 feet.

Before finally deciding upon the site now selected for the terminus of the railway and the construction of the wharves, the harbor and its approaches were carefully surveyed by the officers of Her Majesty's surveying ship *Egeria*, and Commander Field, R. N., reported upon the harbor as follows:

> Inspection shows the port to be deep and clear of dangers, and the eastern shore of the river, southward of the police station, is well adapted for wharves, the deep water on that side extending close up to the shore throughout. * * * Reference to the chart of New Harbor, Singapore, shows that the space for getting away from the wharves varies from 200 to 400 yards, and the total length of the wharfage (east of the Peninsular and Oriental wharf) is about 2,000 yards. The port of Kuala Klang, therefore, appears to compare not unfavorably with New Harbor as regards capacity and capabilities.

From this, it may be confidently assumed that the harbor now selected will be of sufficient extent for the accommodation of the traffic of the State for some years to come. However, should the trade in the future demand greater facilities and accommodation, an extension of the railway to the Klang Straits, a distance of 3½ miles, will command access to what has been described by competent authorities as the finest natural harbor on the western littoral of the peninsula.

From its geographical position, the State of Selangor is the natural center of the Malay Peninsula, and possessing as it does the finest and most commodious harbor, it is natural to assume that the development of the trade of the adjacent native States will be to some extent

influenced by these facts. Particularly is this the case with regard to the protected native State of Pahang, on the eastern side of the peninsula, whose principal trade route, the Pahang River, is virtually closed to trade for five months each year, owing to the difficulty and danger in crossing the bar at its mouth during the continuance of the northeast monsoon.

In addition to the railway originally built from Klang to Kuala Lumpur, a distance of 22½ miles, and the extension to the coast which has been described above, the line has been extended from Kuala Lumpur northward for 38½ miles through the mining centers of Rawang and Serendah to Kuala Kubu, a distributing center for the districts in the north of the State, and for the tin and gold mining country at the source of the Pahang River and its tributaries.

The township of Kuala Kubu, the present terminus of the railway, is situated 16 miles from the boundary of the State of Perak, on the north, and 21 miles from the boundary of the State of Pahang, on the east. To the south the railway is being extended from Kuala Lumpur to the township of Sungei Besi, a distance of 8 miles, the center of a large tin-mining district of the same name. From this point a route has been surveyed in a southerly direction through the mining and agricultural district of Ulu Langat, and thence in an easterly direction over the mountain range which forms the backbone of the peninsula to Temerloh, a point on the Pahang River midway between its mouth and its source. This extension, should it be constructed, would form a trunk line connecting the center of Pahang with the harbor on the west coast, already described, thereby giving that State direct communication by rail and sea with the chief center of trade at all seasons of the year. Other routes over the central range have been explored, with the view of carrying the railway into the State of Pahang, in a northerly direction, to the tin and gold mines already referred to, near the source of the Pahang River, and the majority of these have been found feasible, though they would be more costly than the route to Temerloh.

In crossing the range on any of the explored routes, the line would afford access to altitudes of 5,000 to 6,000 feet, where a temperature of about 53° F. may be enjoyed—a desideratum in a tropical country where the mean temperature in the plains is over 80° in the shade.

The railway has been built by the government of Selangor entirely out of the State revenues, with the exception of the sum of $312,000, which was borrowed from the government of Perak and from the Colony of the Straits Settlements in 1885 for the construction of the original line. This sum has been paid off, and all the extensions of the original line have been constructed out of the revenues of the State, and, along with the line originally constructed, are earning a handsome return on the capital invested. The increase of the traffic, both in goods and passengers, carried by the railway has been, like the development of the State itself, little short of phenomenal.

The subjoined table shows the yearly increase in the traffic and the increase in the working expenses since 1890:

	1890.	1891.	1892.	1893.
Capital expended	$1,062,267	$1,100,299	$2,092,574	$2,679,547
Mileage open	22½	22½	42½	49
Gross earnings	$302,813	$310,379	$380,452	$527,615
Gross expenditure	$126,739	$122,926	$149,388	$197,839
Net revenue	$176,074	$187,453	$231,064	$329,776
Percentage of working expenses to gross receipts	41¾	39⅔	39¼	37½
Profit on capital (per cent)	16.50	17.03	11.04	12.31
Net earnings per train mile	$3.31	$3.19	$3.12	$2.52
Number of passengers carried	125,323	134,513	182,211	661,627
Tons of goods carried	50,132	50,915	62,749	96,090

The line is controlled entirely by the government, and is managed and worked by a staff of English officials, with native subordinates. The track is in good order throughout, and there is frequent communication between all parts of the line. Between Klang and Kuala Lumpur there are four passenger trains each way every day, beside numerous goods trains. To the north there are two trains to Serendah daily and to Kuala Kubu one.

The passenger fares and freight charges for goods vary on different parts of the line, but generally they may be taken as follows:

Klang and Kuala Lumpur division.

Passenger fares (per mile).	Cents.	Freight rates (per ton per mile).	Cents.
First class	5	General merchandise	8-33½
Second class	3½	Rice	33
Third class	2	Tin ore (or me'allic tin)	12

Kuala Lumpur and Kuala Kubu division.

Passenger fares (per mile).	Cents.	Freight rates (per ton per mile).	Cents.
First class	5	General merchandise	8-25
Second class	3½	Rice	11
Third class	1½	Tin ore (or metallic tin)	9½

SUNGIE UJONG RAILWAYS.

The Sungie Ujong Railway was accepted from the contractors in July, 1891, and has since been worked by a private company with headquarters in London. The company has a local agency in Singapore, and managers and staff at Port Dickson and Seremban. The interest on the capital employed, at 4 per cent, amounts to $35,766, and under the terms of the concession the State is liable for whatever sum under this amount is earned annually by the company working the line. In July, 1892, the whole of this sum was claimed, and there was a further claim for losses, which was disallowed. In July, 1893, a payment of $22,119 was claimed and allowed, and a further claim in connection with certain agency and other charges was disputed and is still pending.

In the estimates for 1894, the sum of $15,000 has been set aside to meet the railway guaranty, on the supposition that the line will earn at the rate of about $2,000 a month for the year ending with July, 1894.

The line is single track, 1 meter gauge; its length between termini, Port Dickson and Seremban, being 24 miles. There are but two intermediate stations, Kwalla Sawah and Rassak.

The total expenditure in 1893 amounted to $66,961, and the receipts to $84,642, giving a net surplus of $19,681. The average monthly expenditure was $5,580, and the average monthly receipts $7,053.

The following comparisons between figures for 1892 and 1893 may be of interest:

	1892.		1893.	
	Month.	Amount.	Month.	Amount.
Expenditure:				
Highest	January	$5,623.00	December	$6,839.00
Lowest	April	4,397.00	April	5,190.00
Receipts:				
Highest	August	7,540.00	March	7,555.00
Lowest	April	4,882.00	April	5,557.00
Earnings per train mile:				
Highest	August	.72	May and November.	.65
Lowest	June	.03	April	.12½
Train mileage:				
Highest	October	3,555	August	3,304
Lowest	May	2,530	April	2,914
Goods carried (in piculs):				
Highest	August	18,853	December	20,620
Lowest	April	12,030	April	16,093
Passengers (number):				
Highest	February	3,741	March	3,918
Lowest	June	3,020	August	3,029
Working expenditure per train mile:				
Highest	January	$2.36	March	$2.18
Lowest	October	1.48	August	1.61

The Perak and Selangor figures for 1893 are presented for comparison:

Items.	Selangor.	Perak.	Sungie Ujong.
Gross receipts per traffic mile	$3.85	$1.77	$2.30
Gross expenditures per traffic mile	2.57	1.37	1.83
Net earnings per traffic mile	2.57	.40	.47
Per cent of working expenses to gross receipts	33	76	76

The passenger traffic on the Sungie Ujong Railway remains almost stationary, but the goods traffic is steadily increasing.

The permanent way is now in a better condition than when the road was accepted from the contractors, and requires little expenditure to keep it in order.

In the report for 1892, it is stated that the average yearly expenditure on the Linggi Railway up to 1890 was nearly $17,000, whereas since 1391, the expenditure has been only $3,000, and I doubt if the road could have handled a traffic of 200,000 piculs (13,334 tons) without a much larger expenditure than $17,000. The Jelebu road now costs the State about $25,000 a year.

The freights charged by the company are, except for certain articles, the highest allowed under the terms of the concession. They are less for most things than would have been charged for cartage, but this is counterbalanced in the eyes of local traders by the distance that goods have to be carried to and from the station at Seremban and the delays that occasionally occur in delivering goods from the railway goods sheds. I doubt whether any proposed extension of the line toward Jelebu could compete with cart traffic unless stringent measures to destroy the cart traffic were adopted, as was done on the Linggi Railway. It costs about 30 cents to bring a picul (133⅓ pounds) of tin from Jelebu to Seremban, and I do not think a railway could do it cheaper.

PERAK RAILWAYS.

The government of Perak controls the railways in the State. The termini and main points touched are Port Weld, Taiping, Kamunting, and Ulu Sapetang, on the Larut line, and Ipoh, Lakat, Batu Gajah, Kota Bharu, Kampar, Tapah, and Teluk Anson, on the Kinta Valley line.

The Larut line is 17½ miles in length, the distance from Port Weld to Taiping being 8¼ miles. The Kinta Valley line is 51½ miles long, the distance from Teluk Anson to Kampar being 27 miles, and from Teluk Anson to Ipoh 50 miles. The above are all open for traffic, except about 11 miles now under construction. These lines are single track.

The train service is regular and sufficient for the accommodation of the business.

Passenger fares and freight rates.

Passenger fares (per mile).	Cents.	Freight rates per picul (133.33 pounds) per mile.	Cents.
First class	.....	First-class goods	0.75
Second class	.....	Second-class goods	.50
Third class	.....	Third-class goods	.25

First-class goods comprise groceries, liquor in bottles, glassware, textile fabrics, etc.; second-class goods, coffee, grain, rice, liquids in casks, tobacco, sugar, etc.; and third-class goods, coal, coke, building materials, etc.

Detailed surveys have been made for an extension of the Larut line from Taiping to Kwalla Kangsa, a distance of about 20 miles, and a preliminary survey has been made for a branch from Ipoh to Kwalla Kangsa to connect the Kinta Valley line with the Larut line. A preliminary survey has also been made from Ulu Sapetang to Selama, in Larut, with a view to future extension in the direction of Prai, in the province of Wellesley, opposite Georgetown, in Penang.

DUTCH INDIA.

JAVA.

OCEAN LINES.

The ocean and coast lines supplying service to the port of this island are controlled by companies which receive subsidies from the Governments under whose flag they operate. The main lines are:

Stoomvaart Maatschappy Nederland (Netherlands Steamship Company).—This company furnishes a fortnightly mail and passenger service between Java and Amsterdam.

Stoomvaart Maatschappij Rotterdamsch Lloyds (Rotterdam Lloyds Steamship Company).—A fortnightly mail and passenger line is operated by this company between Java and Rotterdam.

Queensland Royal Mail Line.—This company has a monthly passenger service between Java and London, and also carries the mails between Java and Queensland (Australia) ports.

Peninsular and Oriental Royal Mail Line.—This company includes among its numerous services a fortnightly mail and passenger line between Java and Europe, via Singapore.

Messageries Maritimes Line.—A fortnightly mail and passenger service is operated by this company between Marseilles and Batavia, via Singapore.

ROUTES.

The Netherlands Company's steamers run between Batavia and Amsterdam, via Genoa, calling at Padang, Aden, Suez, and Port Said.

The Rotterdam Lloyds vessels run between Batavia and Rotterdam, via Marseilles, calling at Colombo, Pirim, Suez, and Port Said.

The Queensland Royal Mail Line steamers run between Batavia and London, calling at Colombo, Aden, Suez, Port Said, and Naples.

The Peninsular and Oriental Royal Mail Line carries the mails between Batavia and London, via Brindisi, calling at Singapore (connecting with the home boat), Colombo, Aden, Suez, and Port Said.

The Messageries Maritimes boats run between Batavia and Marseilles, calling at Singapore (connecting with the home boat), Point de Galle, Aden, Suez, and Port Said.

The following table shows the lengths of the various routes and distances from Batavia to principal ports of call:

Name of company and port.	Miles.	Name of company and port.	Miles.
Netherlands Company.		Batavia to—	
Batavia to—		Pirim	4,500
Amsterdam	9,100	Marseilles	7,100
Colombo	2,000	Marseilles to Rotterdam	1,900
Aden	4,000	*Queensland Royal Mail Line.*	
Genoa	6,700	Batavia to—	
Genoa to Amsterdam	2,400	London	8,716
Rotterdam Lloyds.		Colombo	2,000
Batavia to—		Aden	4,000
Rotterdam	9,000	Naples	6,644
Colombo	2,000	Naples to London	2,272

The Peninsular and Oriental and Messageries Maritimes companies have each a steamer in a special service between Batavia and Singapore. The distance from Batavia to Singapore is about 600 miles.

CONDITION AND EQUIPMENT.

The Netherlands Company and Rotterdam Lloyds are long-established lines, and their vessels and service are good in all respects. They have now a fleet of fine ships and are adding new steamers every year. Their average time of passage is twenty-eight days. Both companies are in good financial condition and have been paying yearly dividends of 6 per cent.

The Queensland Royal Mail Line is an English company, the steamers being owned by the British India Steamship Company. It has been long established and is in first-class condition. This line has the largest and finest vessels calling at Batavia, and they generally make the passage from London in thirty days. Having an agreement with the other mail lines, these steamers do not bring mail to Batavia from Europe, and only take mails from London to Queensland and from Batavia to Queensland, returning with mails from Queensland to Batavia and London.

The Peninsular and Oriental Royal Mail and Messageries lines are well known in all ports in this division of the world, and, without exception, are the two best mail services in the East. They have only branch steamers running between Batavia and Singapore. These two companies have landed European mails in Batavia in twenty-six days, but the usual time is twenty-eight days.

The Netherlands Company has ten steamers, averaging 3,000 tons (gross) and 500 horsepower each.

The Rotterdam Lloyds has twelve steamers, averaging 2,000 tons (gross) and 400 horsepower each.

The Queensland Royal Mail Line has ten steamers, averaging 4,000 tons (gross) and 600 horsepower each.

The Peninsular and Oriental and Messageries Maritimes companies have each one steamer running between Batavia and Singapore of about 800 tons (gross) and 120 horsepower.

All the steamers of these lines are fitted with the latest improvements, including electric lights and hydraulic power.

PASSENGER AND FREIGHT RATES.

By the Netherlands Company and the Rotterdam Lloyds, the through first-class passenger rates to either Amsterdam or Rotterdam is $301.50.

By the Queensland Royal Mail Line, the through rate, first class, is $201.

By the Peninsular and Oriental and Messageries Maritimes lines, the through rate, first class, is $281.40.

The Netherlands Company, Rotterdam Lloyds, and Queensland Royal Mail lines are combined and have a regular tariff for freight. The rates for dead weight are 61s. 6d. ($15) per 12 hundredweight (1,344 pounds) through to London and other European ports, and for measurement goods 27s. ($6.56) per 40 cubic feet. These lines also take cargo through to New York and Boston at the following rates: Dead weight—Boston, 82s. 6d. ($20.06); New York, 70s. ($17.03) per 12 hundredweight. For measurement goods—Boston, 36s. 6d. ($8.89); New York, 27s. ($6.56) per 40 cubic feet. These are the only mail lines taking through freights to European and United States ports.

COAST LINES.

The Koninklijke Paketvaart Maatschappij (Royal Packet Company) is the only company operating a coast service for mails and passengers. It is under the control of a Holland corporation, and is allowed a subsidy from that Government.

Batavia is the principal starting point and terminus of these steamers. They run east to the islands of Ceram and Ternate, of the Moluccas, calling at all the principal Java ports—Cheribon, Samarang, and Sourabaya. They also run to Borneo and Celebes. To the west they run to Poloe Bras (Acheen), calling at all Sumatra ports—Palembang, Telok Betong, Benkoelen, and Padang. Steamers leave Batavia every five days for Javan ports and every week for the Moluccas, Borneo, Celebes, and Acheen. There are also a number of extra steamers run by this line to different Javan ports when required.

The total route of these steamers is about 2,150 miles, viz, Batavia to the Moluccas, 1,450; Batavia to Achen, 700.

The distances between the principal Javan ports are as follows:

From—	To—	Miles.	From—	To—	Miles.
Batavia	Cheribon	120	Batavia	Telok Betong	90
Cheribon	Samarang	110	Telok Betong	Benkoelen	200
Samarang	Sourabaya	130	Benkoelen	Padang	180

The company has been in existence since January, 1890, and is, in every respect, in first-class condition. For the year 1893 it paid a dividend of 9 per cent. The steamers are nearly all new, having been built within the last five years, and others are added yearly. They are fitted with all the latest improvements and lighted by electricity.

There are thirty steamers belonging to the company, averaging from 500 to 1,500 tons register, with horsepower ranging from 160 for the larger boats to 90 for the smaller ones.

Steamers for Javan ports leave Batavia and Sourabaya every five days; for Celebes and the Moluccas every week, and for Acheen and other Sumatra ports weekly. There are extra steamers to Javan ports and Celebes when the regular service is found insufficient for the traffic.

The first-class passenger rates by this company for short distances are 8 cents per mile, and for long distances about 6 cents per mile.

The freight rates for dead weight between termini is about $2.80 per ton, and for measurement goods $5 per ton of 40 cubic feet; from Batavia to Samarang the rate for dead weight is about $1 per ton, and for measurement goods about $2 per ton of 40 cubic feet, and from Batavia to Sourabaya, for dead weight, about $2 per ton, and for measurement goods about $3.50 per ton of 40 cubic feet.

RAILWAYS.

STATE RAILWAYS.

Eastern lines.—According to official returns for 1893, the main lines of the State railways run (1) from Kalimas to Solon, via Sidhoardjo, Moajokerto, Kertosono, Madsen, and Parm (167.5 miles), and (2) from Kertosono, via Kediri and Toeloeng Agoeng, to Blitar (57.5 miles). A branch line runs from Sidhoardjo, via Banzil and Pasaeroean, to Probolingo (47 miles), and another branch from Banzil to Malang (30.6 miles), making a total mileage of 302.4.

The branch from Banzil to Malang is being extended to Blitar, via Kepandjin and Whingi, and the branch from Sidhoardjo to Probolingo is being extended to Lotobondo, via Randoeagaeng, Djembeo, Kalisaat, and Bondowono, with a side branch, Randoeagaeng to Pasirian.

These line are single track and the width of track is uniformly 3 feet 5 inches.

The gross earnings for the financial year were $1,829,427, and the working expenses $810,648, making the net earnings $1,018,779. The total capital invested to December 31, 1893, was $15,083,414.

Passenger fares are 2.2 cents, 1.6 cents, and 6 mills per kilometer (0.6214 mile) for first, second, and third class, respectively. Freight rates are $1.89 per ton.

The only obstacles which had to be overcome in the construction of these roads were the bridging of the Solo and Brantas rivers, both of which are crossed by bridges of the Schwedler type. The piers of the bridge over the Solo are of masonry, and the rails are 67 feet above the lowest point of the foundations. The foundations of the piers of the Brantas bridge are of masonry, concrete, and piles, and the rails are 62 feet above the piles.

Western lines.—The western division of the State railway system is made up of two main lines and branches, the mileage of which is as follows: (1) Batavia to Tondjong Cricok, 5½ miles, from which place to Buelenzorg, 34 miles, a private line is used. From Buelenzorg the State system continues, via Sackaboemi, Tjiondjoer, Bandoeng, Tjitjalengkar, Tjibatoe (connecting with a branch to Garact, 12 miles), and Malamong to Tasik Malaijo, 167.8 miles; (2) Djokjakarta, via Wates, Koetoarjo (connecting with a branch to Paeroworedjo, 7½ miles), and Maos, to Tjilatgap, 109 miles.

The gross earnings and expenses of the western lines and branches in 1893 were:

Line.	Earnings.	Expenses.	Net earnings.
No. 1	$541,342	$359,794	$181,544
No. 2	336,824	219,714	117,110
Total	878,166	579,508	298,654

The capital invested to December 31, 1893, in these lines was: Division No. 1, $9,128,863; division No. 2, $5,791,874.

The chief engineering features of these lines are: Tjitaroem viaduct, a continuous-girder lattice bridge, loaded on the upper side, rails 196 feet above the bed of the river; Tjisaät viaduct, of same type as that over the Tjitaroem, rails 189 feet above the bed of the river; Tjiherang viaduct, built on iron pillars on a curve of 150 meters radius, rails 115 feet above bed of the river; Tjitandoei viaduct, combined highway and railway bridge, two girders, tubular type, rails 209 feet above the foundation.

PRIVATE RAILWAYS.

Netherlands India Railway.—From Batavia to Tandjong Priok, and forms the connecting link for the State system between Batavia and Buitenzorg, 34 miles.

Batavia Eastern Railway.—From Batavia, via Mount Corneles and Bekasi, to Krawang, 35 miles.

Samarang-Werstenlanden Railway.—From Samarang, via Kedoeng Djati, Joendik, and Solo, to Djocjocarta, 103 miles, with a branch line from Kedoeng Djati to William I, 24 miles.

When the State line, in course of construction, is finished, it will give direct State railway communication from Panarockan and Sotobondo, on the eastern end of the island, to Batavia, on the western end, via Tjilatjap, on the Indian Ocean, with the exception of the two gaps, connected by private lines, from Solo to Djocjocarta (103 miles), and from Buitenzorg to Batavia, 34 miles.

The following table is prepared from official statements, and shows the gross earnings, expenses, and net earnings of the different companies during 1893, and also the total amount of capital invested to December 31, 1893:

Lines.	Earnings.	Expenses.	Net earnings.
Netherlands India Railway Company	$301,252	$144,699	$156,553
Samarang-Werstenlanden Railway Company	982,340	380,710	601,630
Batavia Eastern Railway Company	115,395	53,724	61,671
Java Railway Company	27,320	20,883	6,437
Total	1,426,307	600,016	826,291

These lines are single track. The Samarang-Werstenlanden road is 4.68 feet gauge and the others 4.17 feet gauge.

The following are the passenger and freight rates on the four lines per kilometer (0.6214 mile):

Lines.	Passenger rates.				Freight rates per ton.
	First class.	Second class.	Third class.	Fourth class.	
	Cents.	*Cents.*	*Cent.*	*Cent.*	*Cent.*
Netherlands India Railway Company	2.6	1.5	0.6	0.4	0.032
Samarang-Werstenlanden Railway Company	2.4	1.5	.8	.4	.028
Batavia Eastern Railway Company	2.0	1.2	.7	.....	.028
Java Railway Company	2.4	.....	.8	.....	.036

B. S. RAIRDEN,
Consul.

BATAVIA, *January 1, 1894.*

SUMATRA.

RAILWAYS.

State railways.—The State system comprises a line from Poelaeajer to Sawah Loento, via Padang, Kajoetanam, Padang-Pandjang, and Batoetabal to Solok, 94 miles, with branch lines from Padang to Emma Harbor (4.4 miles), and from Padang-Pandjang to Fort de Kock (12 miles), making a total mileage of 110.4.

Private lines.—The Delhi Railway Company operates a line from Balawan to Delhitrewah, via Laboean and Medan (21 miles), in connection with which are branches from Medan, via Serdang, to Perboeang (23 miles), and from Medan, via Tombang Lankat, to Selesfeh (19.5 miles); total mileage, 63.5.

The following figures will show the earnings and expenses, as officially stated, for the financial year 1893, and also the total capital invested to December 31, 1893:

Lines.	Earnings.	Expenses.	Net earnings.	Capital invested.
State railways	$300,664	$172,234	$128,430	$7,262,795
Delhi Railway Company	369,881	177,647	192,234	2,762,327
Total	670,545	349,881	320,664	10,025,122

The following are the passenger and freight rates on the State and private railways per kilometer (0.6214 mile):

Lines.	Passenger rates.			Freight rate per ton.
	First class.	Second class.	Third class.	
	Cents.	*Cents.*	*Cents.*	*Cents.*
State railways	3.7	2	1.3	1.7½
Private railways	5.8	3.3	2.1	.8

B. S. RAIRDEN,
Consul.

BATAVIA (JAVA), *January 1, 1891.*

CHINA.

SHANGHAI.

INTERNAL COMMUNICATIONS.

Of the artificial means devised in the interest of the internal communications of China, the Grand Canal takes precedence. The conception and construction of this waterway evidence great mental breadth and skill, but as a work of technical excellence, it does not compare with the canals of western countries. At the time of its construction, however, there was no other similar waterway in the world equal to it, and there is no work of the kind now in Asia comparable with it. The entire length of the canal is about 650 miles, or not quite twice that of the Erie Canal, and its utility is inestimable. The Great Wall of China is but a useless monument of industry, while the Grand Canal bears daily attestation to the prudent foresight of the Emperors who have given it their fostering care. The one stands in solemn stillness where it stood centuries ago; the other ever moves, freighting from province to province the rich productions of the Empire. The wall was built to beat back the Tartar, but the Tartar now sits upon the throne of China, while the canal, constructed in the interests of peace, continues to perform its office, and keeps fresh on the page of history the name of its projector. Marco Polo says the Grand Canal was designed by Kublai, and describes it thus: "You must understand that the Emperor has caused a water communication from this city (Kua-chan) to Cambaluc, in the shape of a wide and deep channel dug between stream and stream, between lake and lake, forming, as it were, a great river on which large vessels can ply." But the most accurate authority on Chinese history (Williams's Middle Kingdom) maintains that this useful work existed before the day of Kublai, and states that it was repaired by the founder of the Lin dynasty, A. D. 600.

As the character of the internal traffic of a nation indicates its civilization, a close observer writes that while there is much to be admired in China, the good in almost every case is marred by some defacing or neutralizing quality. "Just as the outward appearance of their furniture is spoiled by the exquisite discomfort of their chairs and divans, and their stately ceremonies by dirt and squalor, so their means of travel, which in some ways are luxurious, are discredited by the discomforts of the carts, the mud and ruts of the roads, and the miserable condition of the inns."

But although the rivers and roads of China are impossible for quick locomotion, the real commerce of China is the internal commerce, which is developed on an enormous scale. The Empire is a vast network of rivers and canals, and these are the main channels of intercommunication between the provinces. As early as 1656, Father Magilliam writes

that he navigated the Grand Canal and other rivers for more than 1,500 miles without going by land more than one day's journey.

But, unfortunately, the principal channels for the internal commerce of China do not appear to have been touched by the hand of modern improvement. The large vessels which Marco Polo saw on the Grand Canal have given place to small junks, and even these navigate it with much difficulty. The Yellow River remains a menace to the rich meadows through which it flows and to the lives of the thousands of inhabitants who live on its banks. Impediments to navigation and obstructions which change the course of rivers remain untouched as the years go on.

The famed highways which excited the admiration of the early European travelers are now in an almost impassable state. Their condition is such that passage over them is virtually stopped, as the holes and ruts that deface them force travelers to desert them for the tracks by the sides, although these in wet weather are but quagmires, and in dry weather several inches deep in dust.

The roads in general use, correctly described as merely the customary roads from village to village, are never macadamized, and follow all the natural irregularities of the surface. They are undrained, and in low sections are zigzag in their courses, carriers being compelled to vary their routes to escape the pools of water or the pitfalls and other obstructions. Even such roads are often the subject of contention for occupancy between the farmers and the carriers, and the contention is encouraged by the fact that the farmer has the right to plow up the road running through his land, and the carrier has the right to drive over any part of the land. These opposing rights end in compromises by which certain defined courses and limits are marked out for the roads. In the provinces devoted more exclusively to the cultivation of rice the roads are more permanent in course and limit. Here granite stones are often laid in the center of the main road, but only wide enough for the ordinary handbarrow, with its wheel in the center. In hilly districts the roads generally follow the water courses, but receive little attention and are frequently impassable. To describe the condition of one road in China is, substantially, to describe all; and they are uniformly bad.

Public opinion in China has opposed the building of railroads in the Empire. Whenever such works have been in contemplation this hostile opinion energetically shows itself, and the solid wall of resistance has never been overcome.

In 1876 British merchants at Shanghai built a railroad from the city to the mouth of the Woo Sung River, a distance of about 15 miles, but in 1877 the provincial authorities acquired compulsory possession, tore up the road, and paid for it. The city of Shanghai is situated on the Woo Sung River, and there is a bar at the entrance of the river which prevents ships of large tonnage from approaching nearer the city.

The road was necessary to facilitate quicker communication and the handling and delivery of freight; but the all-prevailing prejudice of the Chinese to progress defeated the realization of any practical benefits from the enterprise. The commercial interests of Shanghai render such a road necessary.

The railroads undertaken, and in part completed, in another section of China have escaped the fate of the road that connected the commercial metropolis with the sea. On British-built carriages, upon British steel rails, one can travel from Tongku, near the Taku forts at the mouth of the Peiho River, over the 27 miles to Tientsin; while from Tongku the main line is prolonged for 67 miles to the Tungshan and Kaiping coal fields, and thence as far as Shan-hai-kwan, the seaward terminus of the Great Wall, in the direction of Manchuria.

Although the conservatism of China has so steadfastly resisted all attempts at internal improvement, there is a sentiment in the Empire which recognizes the necessity for keeping step with progress. The alarm produced by the French war in 1884 greatly encouraged the progressive statesmen of China, and it was due to the influence of one of the foremost of her great statesmen, Li Hung Chang, that the tracks of the road described were laid. The Trans-Siberian Railway of Russia to Vladivostok has awakened new interest and proved an additional encouragement to the efforts for the advance of railroad building in China. But the reason why China should develop her immense resources on modern lines has at last unanswerably forced itself upon those who would neither see nor hear. The war with Japan, in which a nation of less than one-fifth her size has dictated terms of peace, as it were, at the gates of China, can not fail to make a lasting impression. China must understand that her present reverses might have been averted had she, like her neighbor, imbibed the spirit of progress. The reserve forces of the Chinese in numbers and wealth, aided by the concentrating power of the railroad, would have been as irresistible to an invading foe as were their ancestors when victoriously sweeping over these plains under the standard of Kublai.

A few years ago, the Empress Dowager of China, one of the great women of the world, addressed interrogatories to the principal provincial governors and governors-general, inviting their counsel on the subject of railway extension in the Empire. The replies thus elicited indicated an affirmative change of sentiment, and one of them deserves to be quoted, in part, word for word:

> We shall thereby be able to send troops, money, etc., anywhere within our Empire within ten days; and, moreover, we shall be able to found prosperous colonies in those outlying regions of people who in China proper are only a starving proletariat, and a source of trouble to the Government, but who, once transplanted thither, will be able to find a fruitful field for their now unemployed labor, and will turn the desert into a garden.

The quotation shows that the author of the reply from which it is taken comprehended the needs of his country. It evinces a knowledge

of the use of railroads as a means of national defense and for the relief of human wants. The area of China is as large as the area of the United States, and the different climatic influences prevailing sometimes prove disastrous to the crops of one section while an abundant harvest is gathered in another, and there being no quick facilities for transportation the pitiless ravages of famine go unchecked. In nearly every annual report there is a page devoted to telling of the absolute necessities of certain provinces of China and the sufferings of the inhabitants because of the absence of means for expediting relief. From a military standpoint, the want of railroads has rendered useless the superior numbers which China could otherwise concentrate against any invader; and passing events must teach the most conservative statesman that China will have to inaugurate a policy looking to the development of the Empire, or the Empire may be dismembered or fall to pieces of its own helplessness.

The belief is entertained that, whatever may be the tendency of the results of the war between China and Japan, the former will abandon her policy of opposition to improvements and move forward on modern lines of development. The operators whose perseverance and skill have interlaced the United States with the best equipped railroads of the world may soon find an inviting field on Asiatic soil. China will want new war ships, railroads, army and naval stores and equipments, and will probably not be averse to enlisting skill which no enterprise has ever baffled. These general observations in connection with the internal means of communication in China may be appropriately supplemented by information on the subject of a more particular character.

On the 1st of October, 1890, the council of the China branch of the Royal Asiatic Society distributed widely through China a circular requesting information as to the routes and means of carriage existing in the various parts of China and the facilities for the transportation of passengers and merchandise. Answers to the circulars have been received from fourteen out of the eighteen provinces into which China has been divided, and have been published in book form; and the subject is so concisely and intelligently presented in the notes which preface the publication that I give them in full:

> Probably no country in the world, certainly none aiming at civilization even of the most rudimentary nature, has paid so little attention to roads and means of communication as has the Chinese Empire; and it may be remarked at the outset that no road in the European acceptance of the term, as an artificially constructed viaduct, laid out with engineering skill even of the crudest description, exists from one end of China to the other. Three partial exceptions may be noted, the road from Tung-chow to Peking, the road from Han-chung to Chong-tu, and that formerly existing between Nanking and Fung-Yang, all described below. Otherwise the roads as they exist are merely the customary tracks from one town or village to another, are never macadamized, and follow all the natural irregularities of the surface. They are never bounded by fences, are generally undrained, and when proceeding through level plains are entirely undefined and wander about from side to side as puddles of water or artificial pitfalls dug by the neighboring farmer compel the drivers of vehicles to vary their route.

Every spring, in the southern provinces at least, a struggle for occupation takes place between the carters and farmers. The farmer has, on the one hand, a perfect right to plow up any road passing through his land, and, as a matter of fact, generally exercises this right; on the other, the teamster has an equal right to drive his wagons over the country at large, and equally, as a matter of fact, exercises it. To prevent the ruin of his own crops, and to force, if possible, the track upon his neighbors, the farmer then begins to dig pitfalls along the most frequented route, compelling the teamster to move to one side. As it is evident that he can not continue these greatly without inflicting more damage than he is likely to suffer from the passage of the carts, a compromise is gradually arrived at, and the tracks from year to year follow approximately the same lines. In the loess-covered provinces the circumstances of the case compel a different system. Owing to the numbers of ravines crossing the country in all directions, the limits of deviation are narrower than in the plains of Shantung and Chili; the constant passage of the carts keeps the surface continually stirred up, and the wind catches the fine particles of sand, of which the loess is mainly composed, and carries them over the adjacent country. In consequence, the tracks have a continual tendency to sink below the surface, and are often found occupying narrow passages sunk 30 or even 50 feet under the general level. In the eastern provinces, from like causes, the roads, when passing through villages or approaching a bridge, are almost invarably sunk below the surface, and the bridge in such cases becomes impassable for wheeled traffic, its abutments being raised many feet above the road level. In the Yangtse delta, and the southern provinces generally, the use of carts and wagons has long been superseded, and the only wheeled vehicle is the handbarrow with the wheel caged in the center. To accommodate this, the centers of main roads are generally paved to a width of 1 or 2 feet with rough granite flagstones. The roads in this case are, of course, permanent, as is, indeed, necessary where rice is extensively grown. They are not, however, laid out on any system, merely following the lines of divisions of the fields. In hilly districts the roads generally follow the lines of the water courses, and are impassable in floods. The bowlders are seldom or never removed, and carts passing avoid them or surmount them as best they can, their motion most resembling that of a ship in distress as they sway about in dangerous proximity to the angle of final stability. Frequently this is exceeded and the cart is overturned. The latter incident is not, however, confined to mountain tracks, the ruts in the roads across the plains being frequently as bad. The writer has, indeed, known a cart to capsize in one of the main streets in Peking and two of its occupants to be suffocated in the filthy mud before assistance could arrive.

That this state of neglect is not of recent origin may be judged from many incidents. The high road from Peking to Shantung and Kiangnan crosses the old bed of the Yellow River at Ping-yuan Hyien, in Shantung. This bed has been entirely deserted since the twelfth century; its bottom is raised a few feet above the level of the plain and is bounded by two raised embankments some 30 feet high. The removal of a few thousand cubic feet of soil would have enabled the road to be leveled the whole way across and a good road made. Instead of this, the entire traffic climbs diagonally up one side of the outer embankment, descends to the bed of the river, and repeats the process on reaching the other embankment. The whole expense of making a good road would not exceed 2,000 taels. And this is one of the most important routes in the Empire.

The emperors of the Yuan dynasty are credited with greater care for the internal communications of the Empire than their successors, and the road referred to above, from Peking to Tung-chow, remains as a vast effort of inutility. It is paved with magnificent blocks of granite, closely jointed. It is now worn into ruts, often exceeding a foot in depth, and is almost impassable. A second effort in road building was made by Hung-wu, first emperor of the Mings (1368–1399 A. D.), who made a roadway from Pukee, on the north bank of the Yangtse, opposite Nanking, his capital, to Fung-Yang, in Anhwei, his birthplace. This road is remarkable as an

early piece of engineering, the levels being carefully graded and the road carried across the river valleys which intersect on well-built arched viaducts, one of ten well-built stone arches. The city of Chu-chow, through which the road passes, owes to the same monarch some beautifully designed stone bridges, with segmental arches, a rare, if not unique, form in China. Even here the builder had not thoroughly grasped the idea of an arch, the bridge being composed of a series of parallel stone ribs, each alternate stone being a long stretcher. Beyond these roads no feats of engineering skill have been attempted in connection with the land communications of China, for the celebrated stone bridges of Fukien and elsewhere, though remarkable as showing the ability of the Chinese to move huge masses of stone by manual labor, as feats of engineering are not worthy of extended notice.

The viaducts on Hung-wu's road have long since fallen into disuse, in this, indeed, recalling the usual practice of the Chinese, whose buildings, from the day that they are completed till their final collapse, seldom undergo repair of any kind. More especially is this the case with the roads, for the keeping in order of which no regular funds are available; nor is any provision made for their superintendence. The repairing of roads is, according to Buddhistic ideas, a work of merit, but is so rarely exercised, however, that whenever a repair is effected the donor takes care to have it recorded by a stone tablet the erection of which not infrequently costs more than the entire reparation.

In the central and seaboard provinces, as a rule, no governmental provision is made for the making or repairing of roads, and the burden is thrown on private parties. Any little work is effected by means of private clubs, which collect subscriptions and supervise what is done. Sometimes, but very rarely, when things have come to the point that traffic is actually impossible, the officials will step in and levy taxes for the purpose; but the people have so well grounded a suspicion of the object as well as the honesty of these officials that such levies are often resisted and are always unpopular.

In the western provinces, where roads have frequently to be maintained for long distances through thinly populated districts, the officials have to make provision for their repair. The soldiers are generally utilized for the purpose, but occasionally the labor is raised by corvée from adjoining villages.

What applies to roads generally applies more or less directly to bridges, but with the reservation that the maintenance of the bridges is always recognized as an official duty. Bridges are seldom repaired, and unless newly erected are for the most part utterly neglected. They are never built on scientific principles. Where good granite or flagstones are obtainable they generally consist of lintels thrown across stone piers, and these simple structures are usually in the best condition. When one of the lintels breaks or becomes displaced, it is not repaired, but the breach is filled with the trunks of trees, or in the north with millet stones, covered with earth and small paving stones. It is not until the road becomes absolutely impassable that repairs are taken in hand, and by the time they are commenced the edifice has become so dilapidated that entire rebuilding is necessary.

When suitable, the bridges assume an arched form. The arch, however, has never been thoroughly naturalized in China. Lines of vousseirs are laid at distances of from 5 to 9 feet, and the spaces between are occupied by thrust blocks of stone joggled at both ends. As the face of the stone is cut to the intrados of the arch, an element of weakness is always introduced, and as counter arches in the haunches are never made use of, the arch in a few years begins to rise in the shoulders. The road pavement, always of stone, in such a case of course becomes displaced, but that is a matter of little moment to a Chinaman, who has all his life been accustomed to disorder. Over deep and rapid rivers bridges of boats are common, and in some places, where the severity of the winter requires it, provision is made for their annual renewal. Over the gorges of the Kinsh-Kiang and the other rivers between Szechwan and Thibet, and in Shensi, between Sian and Chang-tu, rough suspension bridges

are used. These consist of iron chains, slung from bank to bank, and planked over with wood. As no provision is made for staying or side rails, these are eminently dangerous except in mild weather, and even then can only be crossed by one mule at a time.

Though the Government has taken little or no interest in the condition of roads in the Empire, it has always concerned itself with regard to rivers and canals. It is true also that the knowledge displayed has been of the crudest order, and that, taking the Empire as a whole, its concern has been of little result for good.

Dismissing as myths of the most transparent nature the stories of the Deluge of Yaou and the final triumph of Yu over the surging waters, we find that the first efforts of man to control the waterways of China extend far into prehistoric ages. Long before the birth of tradition even, we find immigrant tribes settling along the course of the Yangtse, which they had apparently descended from the regions west of Szechwan. The wide regions of what is now the Hu-kwang, the ancient name of which was probably Kshar, and survives in the present King and Chu, were tenanted by a people who, under a strong government, seemed likely at one time to become paramount in the north of China. Even now the Hu-kwang is a region of lakes, rivers, and canals; but in those days the expanse of the water gradually filled up by the annual overflows of the great Kiang and its tributary, the Han, must have been both greater and deeper than at present. These people, from the necessities of their daily existence, early learned the art of throwing up dikes and restraining by embarkments the flooding water.

Lower down, and occupying the delta lands of Kiangnan, and extending as far as the mouths of Che-kiang, then tenanted by the people of Yuen, was the Kingdom of Wu, which rose for a short time into prominence among the states of the Chun-tsiu. Through this region flowed the three ancient arms of the Yangtse known as the Sankiang, and within its bounds were the ancient Five Lakes of antiquity, including the great Chen-tseh itself. The people became adepts in the art of controlling their waterways, so that at the present day so modified by artificial works are the courses that it is a difficult thing to restore the ancient drainage lines. To them is probably to be attributed the series of works, still existing, by which the arm of the Yangtse entering the Tai-hu was directed northward. The Sungkiang, which led its waters to the sea, has gradually dwindled to the modern Soochow Creek, and the Hwangpu, dug out as an artificial canal, now takes the drainage of the lower province. The Hai-tang, which prevents the waters of the upper part of Hanchow Bay, now the estuary of the Tsien-tang, from mingling with the fresh waters of the lakes and canals, apparently had its commencement at a time anterior to history, while yet the Tsien-tang, as the Che, entered the sea not far from the ancient city of Yu-yao. The long line of embankments north of the Yangtse, reaching from Yangchoo to Hwai-an Fu, must have been commenced anterior to the time of Chun-tsiu. At this period, doubtless, was constructed the canal from the Hungtse to the Kaoyao Lake, which has so greatly modified the aspect of the northern Kiang-su. The Hwai, which in early days flowed past Hwai-an Fu to the sea, by degrees became diverted along the line of the new canal, and now, through another artificial channel, the Mang-tung, the Ho makes its way by Tai-chow and eventually mingles its waters with the Yangtse.

Tradition tells of the Yellow River escaping through the Nino Ho into the Gulf of Pechili; but by degrees it was embanked and confined to a single channel, before referred to, passing by Ping-yuan Hien, in Shantung. During the Yuan dynasty the Yellow River deserted this course and for a long time flowed in a channel toward Hwai-an Fu, a portion of which was subsequently utilized for the construction of a canal connecting the Tsi, now the Tsing Ho, and the Hwai. Subsequently, guided apparently by the lines of the abandoned outlets of the ancient Yellow River, a connection was made with the Wei, and the Yun-liang, the "Grain-Bearing River," once famous in Europe as the Imperial Canal of China, was completed.

Whether at any time this canal served any more useful purpose than conveying yearly the fleets of junks bearing the imperial tribute from Hwai-an Fu to Tung-chow is doubtful. Of late years it has been a mere ditch, flooded to let the grain junks pass, and immediately closed again, as its defective construction and the mud-laden waters of the Hwang-Ho, with which the northern portion is annually flooded, render its reexcavation every year a necessity. As a means of communication between the northern and southern provinces the canal need not be considered, as not a single vessel except the junks carrying the tribute rice ever passes, the carriage of the rice itself by this route being a fiscal measure benefiting only the official engaged in it, while seriously crippling the revenues of the Empire.

Wherever, then, the Chinese have found a navigable river, they have, by a sort of instinct, endeavored to utilize it; and this habit, older than the system of government itself and sanctified by the earliest tradition, has become a part of the administration. Like everything else of which the Government of China takes cognizance, it is to the last degree ineffective; and it is an open question whether more good or evil has been done by these efforts to control the natural courses of the waterways.

T. R. JERNIGAN,
Consul-General.

SHANGHAI, *April 19, 1895.*

TIENTSIN.

OCEAN TRAFFIC.

Tientsin is peculiarly situated as regards commerce. It is not the terminus of any ocean lines coming directly either from America or from Europe, and it is closed to navigation during the months of December, January, and February, as the entrance to the Peiho River, on which it is located, is blocked by ice during these months.

All merchandise destined for the United States or intended for consumption in the northern provinces of China, of which Tientsin, by its geographical position, is the point of accumulation and distribution, must be transshipped. If goods are exported to the United States, the ports of transshipment are, preferably, Shanghai, not infrequently Hongkong, and sometimes Yokohama. If merchandise is destined for Tientsin, the same ports of transshipment are used.

As regards the movements of goods upon the high seas, this report will cover details as to freight and passenger rates to and from Shanghai, Hongkong, and Yokohama, through rates beyond these ports not being quoted here. Through rates to and from the United States may therefore be obtained by adding to the rates given in this report those quoted at Shanghai, Hongkong, and Yokohama.

It will be unnecessary to touch upon the manner of distributing cargo into the interior, as there are no highways, paved or macadamized, and as merchandise passes out of the hands of foreigners and into native control at Tientsin, it is equally unnecessary to attempt to portray the intricacies of the transportation of cargo by camels, by mule litters, mule back, native carts, river craft, etc., from the interior to this port.

COASTWISE LINES.

At Shanghai, coastwise steamers arrive and depart almost daily, and monthly or bimonthly steamers run to and from Japan.

No through rates for passengers or freight are quoted by the agencies of the various steamship companies whose vessels call at this port. To obtain through rates those given herewith must be added to those given from Shanghai or Hongkong, China, and Yokohama or Kobe, Japan. It rarely happens that passengers take steamers direct to Hongkong from here, as they prefer to transship at Shanghai to steamers of the Messageries Maritimes or Peninsular and Oriental lines.

The various steamship companies making this a port of call and having agencies here are the Canadian Pacific and the Peninsular and Oriental steamship companies, Jardine, Matheson & Co., agents; the Pacific Mail and Occidental and Oriental steamship companies, A. Philippot & Co., agents; the Messageries Maritimes, William Forbes & Co., agents, and the Northern Pacific Steamship Company, Wilson & Co., agents.

The passenger rates are as follows: To or from Shanghai, first class, 40 taels; round trip, 60 taels. To or from Kobe, Japan, first class, $61 (Mexican); round trip, $106. From Kobe to Yokohama, $10.

In this report, wherever tael prices or teal rates are given it may be assumed for the purpose of calculation that a tael is worth $1.43 (Mexican). To calculate the value of the Mexican dollar in terms of United States gold the rate of the day must be taken, as the value of the Mexican dollar is constantly fluctuating.

The rates to or from Shanghai given above are by steamers of the China Navigation Company, Butterfield & Swire, agents; the Indo-China Navigation Company, Jardine, Matheson & Co., agents, and by the China Merchants' Steamship Navigation Company. The rates quoted to or from Kobe, Japan, are by steamers belonging to the Nippon Yusen Kaisha, A. Philippot & Co., agents.

The above-mentioned steamship companies are the most important operating coastwise services in China and Japan, and deserve a few words from a Tientsin point of view.

The service on these lines is in all respects first class, the steamers being officered by Europeans or Americans. Compared with those of the great ocean lines, the vessels are small, averaging between 800 and 1,000 tons net register.

China Navigation Company.—The agents for this line of steamers at Hongkong and throughout China and Japan are Butterfield & Swire. It is an English company, with central office in London, John Swire & Sons, agents. The China Navigation Company never sends ships to Europe, but works in conjunction with the Ocean Steampship Company. The fleet of the company is composed of thirty-one steamers, ranging in tonnage from 560 to 2,000. Of these steamers the *Chung Kiang* (801

tons), *Wuchang* (801 tons), and *Tungchow* (952 tons), run regularly between Tientsin and Shanghai. Occasionally other steamers are put upon the route, and in this way an almost daily service is maintained. It is said that these three steamers are the best equipped for passenger service on the coast of China. This company also maintains a service, with two steamers, the *Nan-chang* and *Kwei-yang*, between Tientsin and Hongkong and Canton, but as passengers rarely travel by these steamers the agents are unable to quote fixed passenger rates.

Indo-China Steam Navigation Company.—This is an English corporation, with main office in London. It operates a coastwise service between ports of China to India, and occasionally to Japan. The fleet is composed of twenty-three steamers, including those plying on the Yangtse River.

The regular steamers of this line on the service between Tientsin and Shanghai are the *Liensking* (1,049 tons), the *Pechihli* (881 tons), and the *El Dorado* (892 tons). These vessels are excellently equipped for passenger service and are officered by Europeans. Jardine, Matheson & Co. are agents in all China ports where their firm is represented.

China Merchants' Steam Navigation Company.—This is the great line under Chinese control, and is composed of a large number of ships, of which the following, all splendidly equipped for passenger service, run regularly between Tientsin and Shanghai: The *Hsin Yu* (1,027 tons), the *Hsin Chi* (1,063 tons), the *Hsin Fung* (1,063 tons), the *Hasan* (869 tons), and the *Haeting* (1,099 tons). These vessels are officered by Americans and Europeans. Captain Patterson, an American, of the *Hsin Chi*, has lately completed in the service of this company five hundred round trips between Tientsin and Shanghai. He is a favorite among the foreign residents of the East, and his ship always arrives with a number of passengers, many of whom time their voyage to Tientsin in order to travel with Captain "Pat."

Nippon Yusen Kaisha.—This is the great Japanese line, and a regular service is maintained between Kobe, Japan, and Tientsin, touching at Nagasaki, Chemulpo, and Fusan, Korea, and Chefoo, China. During the year 1893 twenty-one round trips were made by the steamers of this line, the *Genkai Maru* (884 tons) making ten, the *Higo Maru* (871 tons) making nine, and the *Sorachi Maru* (950 tons) making two.

The length of time for transit to or from Shanghai is from two and a half to three days in ordinary weather. The trip to Japan takes, with stoppages, about ten days.

FREIGHT RATES.

The following is the freight tariff between Tientsin and Shanghai and Tientsin and Japan:

Articles.	Unit.	For—		
		Shanghai.	Kobe.	Yokohama.
		Taels.		
Bristles	Ton	2.50	*a* $11.00	*a* $12.00
Carpet, Chinese	do		7.50	8.50
Chinaware	do	2.50	11.00	12.00
Cocoons, waste	Picul	.23		
Cotton	do		.90	1.10
Curios and enamels	Ton		13.00	14.00
Feathers, pressed	do	1.60	7.50	8.50
Furs, common *b*	do		13.00	14.06
Hair, horse and yak	Picul	.23		
Human	do	.45		
Hides and skins, unpressed	do	.23		
Pressed	Ton	2.00		
Horsetails, pressed or unpressed	do	2.50		
Horsehair in cases	do	2.50		
Horse and yak tails	Picul		1.50	1.70
Horse skins, unpressed	do		.60	.70
Pressed	Ton		8.00	9.00
Jute, unpressed	Picul	.17	.70	.85
Pressed	Ton	1.70	7.50	8.50
Leather	Picul		1.10	1.20
Merchandise, sundry	do		.80	.90
Do	Ton		8.00	9.00
Measurement goods, unenumerated	do	2.50		
Paper	Picul		1.10	1.20
Rugs	Ton	2.25		
Silk piece goods	Picul		11.00	12.00
Straw braid	do	.40	1.00	1.20
Sundries, stores, etc.	Ton	2.50	8.00	9.00
Wool, unpressed	Picul	.20	.60	.80
Pressed	Ton	1.60	8.00	9.00

a Mexican currency.
b For valuable furs the rate is 5 per cent ad valorem to Kobe and 6 per cent to Yokohama.

NOTE.—For curios and ad valorem goods, excepting treasure, the rate is three-fourths of 1 per cent. For treasure the ad valorem rate is one-fourth of 1 per cent to Shanghai, three-fourths of 1 per cent to Kobe, and 1 per cent to Yokohama.

The rates to Chefoo and Newchwang are three-fourths of the Shanghai rates, and from Tientsin to Hongkong double the Shanghai rates.

The above rates of freight include lighterage charges at the bar at the entrance of the Peiho River, known as the Taku bar. Nearly all steamers must be lightened before they can cross the bar, and this has called into existence a company known as the Taku Tug and Lighter Company.

RAILWAYS.

There is a single-track railway now in running order from Tientsin to the eastern terminus of the Great Wall, at Shan Hai Kuan, on the Gulf of Pechihli, a distance of 179 miles. As there are no foreign merchants at Shan Hai Kuan, and as the country traversed consumes but a small amount of foreign goods, it is unnecessary to enter into details as to freight rates. The first-class fare to or from Shan Hai Kuan is $3.10 (Mexican).

RIVER AND HIGHWAY TRAFFIC.

The maximum fare to Peking in native house boat is $15 (Mexican), and by cart $10 (Mexican). The return passage is somewhat cheaper. The trip can also be made by ponies, relays being arranged beforehand. If the journey is made by house boat or cart, the services of a "boy," at about 75 cents per day, are required, and provisions have to be laid in, costing about $2 or more per day, according to the habits of the individual making the trip. The journey from Tientsin to Peking occupies from two to three days, although the distance is not as great as from New York to Philadelphia.

The trip to the Ming tombs and to the Great Wall beyond is inexpensive, considering that it is made in carts or by mules or ponies. I have heard it estimated that the trip to and from Peking, the Ming tombs, and to the Great Wall north of Peking can be "done" comfortably for about $125 (Mexican), and this general estimate will be a sufficient guide for travelers anticipating such a journey.

SHERIDAN P. READ,
Consul.

TIENTSIN, *August 1, 1894.*

HONGKONG.

OCEAN LINES.

Pacific Mail Steamship Company and Occidental and Oriental Steamship Company.—These are the principal steamship lines plying between Hongkong and the United States. The termini are San Francisco and Hongkong, and the ports of call are Nagasaki, Kobe, and Yokohama, Japan, and occasionally Amoy, China, and Honolulu, Hawaiian Islands.

The distances are as follows:

From—	To—	Miles.
Hongkong	Yokohama	1,600
Yokohama	Honolulu	3,400
Honolulu	San Francisco	2,100
Total		7,100

The fleet of this combination (for these companies have pooled) consists of the four Pacific Mail steamers and the three Occidental and Oriental steamers, as follows:

Name.	Tonnage.	Name.	nage.
China	4,940	Gaelic	4,206
City of Peking	5,080	Oceanic	3,808
City of Rio de Janeiro	3,548	Belgic	4,212
Peru	3,528		

All these vessels are first class in appointment, service, etc.
Departures from termini are made about every ten days.
First-class passenger rates are:

From Hongkong to—	Fare.	Kind of currency.
Nagasaki	$45	Mexican.
Kobe	50	Do.
Yokohama	60	Do.
Honolulu	130	United States.
San Francisco	185	Do.

Freight rates are dependent altogether on the description and amount of cargo.

Canadian Pacific Steamship Company.—The steamers of this line, which is owned and entirely controlled by the Canadian Pacific Railroad Company, ply between Hongkong and Vancouver, British Columbia, touching en route at Shanghai, Nagasaki, Kobe, Yokohama, and Victoria, British Columbia. The distance between termini by the route taken by these vessels and the distance between the different ports is as follows:

From—	To—	Miles.	From—	To—	Miles.
Hongkong*	Vancouver*	6,289	Nagasaki	Kobe	384
Hongkong	Shanghai	811	Kobe	Yokohama	346
Shanghai	Nagasaki	448	Yokohama	Vancouver	4,300

* Terminus.

There are three vessels operated by the company on this line, viz, the *Empress of India*, the *Empress of Japan*, and the *Empress of China*, each of 6,000 tons and 10,000 horsepower. They are considered first-class in all respects.

Steamers are dispatched triweekly during the summer and monthly during the winter.

The first-class fare between Hongkong and Vancouver is £37 ($180) and the rate of freight from $10 (gold) to $12 (gold) per ton of 40 cubic feet.

Douglas Steamship Company, Limited (Douglas, Lapraik & Co., general managers).—This company operates a line of cargo steamers between Hongkong and Swatow, Amoy, Foochow, Tamsui, and Taiwanfoo, China.

The distances by the route of this line are as follows:

From—	To—	Miles.	From—	To—	Miles.
Hongkong	Swatow	175	Amoy	Tamsui	160
Swatow	Amoy	150	Amoy	Taiwanfoo	155
Amoy	Foochow	185			

The vessels of this line and their tonnage are:

Name.	Tonnage.	Name.	Tonnage.
Haitan	1,183	Hailoong	785
Namoa	863	Formosa	674
Thales	820	Fokien	508

These vessels make three or four trips per week to Swatow and Amoy, one or two to Tamsui, one to Foochow, and one every ten days to Taiwanfoo.

Cabin passage from Hongkong to Swatow is $15; to Amoy, $25; to Foochow, $50; to Tamsui, $50, and to Taiwanfoo, $55.

Freights from Hongkong: To Swatow, $3; to Amoy, $4; to Foochow, $6; to Tamsui, $7, and to Taiwanfoo, $7 per ton. Special rates are made for large quantities. The rates given are in Mexican dollars.

Northern Pacific Steamship Company (Dodwell, Carlill & Co., agents).—This is a private company, with headquarters at Glasgow. Hongkong and Tacoma, Wash., are the termini, and the main points touched are Amoy, Foochow, and Shanghai, China; Moji, Kobe, and Yokohama, Japan, and Victoria, British Columbia. The last three are regular ports of call, but the others are only called at when sufficient cargo can be obtained.

The total length of the course between Hongkong and Tacoma is about 6,000 miles, divided as follows between main points: Hongkong to Yokohama, 1,600; Yokohama to Tacoma, 4,315 miles.

The company operates three steamers, all sailing under the British flag.

Name.	Gross tons.	Horse-power.	Maximum speed.
			Knots.
Victoria	3,167	2,800	15
Tacoma	2,549	1,500	12
Sikh	2,672	2,700	13½

The condition of the vessels is considered good.

Sailings are made about every three weeks, the three vessels of the company making from fifteen to sixteen trips during the twelve months.

The rates for first-class passengers, in Mexican dollars, from Hongkong to Shanghai is $40; to Kobe, $50; to Yokohama, $60; and to Victoria, British Columbia, or Tacoma, Wash., $225.

The rate for freight per ton of 40 cubic feet or ton of 2,240 pounds from Hongkong to Tacoma is $10 gold. The rate for freight between intermediate points varies from $1.50 to $5 (Mexican) per ton.

Peninsular and Oriental Steam Navigation Company.—The termini of the China service of this company are Hongkong and London, and the main points touched are Shanghai, Nagasaki, Kobe, Yokohama, Singa-

pore, Penang, Colombo, Bombay, Port Said, Brindisi, and Marseilles, and the following are the distances in miles from Hongkong:

To—	Miles.	To—	Miles.	To—	Miles.
Shanghai	870	Singapore	1,437	Port Said	6,584
Nagasaki	1,067	Penang	1,818	Brindisi	7,514
Kobe	1,456	Colombo	3,096	Marseilles	8,092
Yokohama	1,802	Bombay	3,971	London	10,154

The condition of the vessels is good. The total fleet of this company numbers fifty-five vessels, of which fifteen, of from 3,500 to 5,100 tons and 3,500 to 6,000 horsepower, are in use on the London-China line and perform a fortnightly service, and two, of 3,140 tons and 3,500 horsepower, ply between Hongkong and Japanese ports.

The rates for first-class passage from Hongkong are as follows, in Mexican dollars:

To—	Fare.	To—	Fare.
Shanghai	$40	Egypt	$460
Yokohama	60	Brindisi	490
India	195	Marseilles	490
Australia (via Colombo)	360	London	525

The average rate of freight from Hongkong to London is 45s. to 50s. ($10.95 to $12.17) per ton of 40 cubic feet.

W. E. HUNT,
Consul.

HONGKONG, *August 1, 1894.*

JAPAN.

GEOGRAPHICAL FEATURES.

The peculiar form of the Empire of Japan, that of a very long and narrow territory, completely surrounded by salt water, extending from a point almost adjoining the frozen regions of Siberian Russia to the tropical waters of the Western Pacific, with an average width of not more than 200 miles, and divided throughout its length by a continuous chain of high hills and mountains, suggests that the traffic of the Empire should be carried on by long lines of railway running parallel and in close proximity to its eastern and western coasts, and by ocean coasting vessels, and this seems to be the idea which has governed the Japanese Government and the various transportation companies in planning railroad and ocean lines. The system of railways along the east coast lacks little of completion; that along the west coast has not yet been commenced. The traffic along the east coast is, therefore, divided by the railways and coasting vessels, and that along the west coast is monopolized by the latter.

RIVERS, CANALS, AND HIGHWAYS.

There are in Japan no navigable rivers or canal lines of any importance. In earlier years a large portion of the traffic of the Empire was carried on over the old imperial highways, the principal among them being the Tokaido, running south from Tokio along the east coast; the Nakasendo, running north and south, but lying farther back and at a greater elevation above the sea; and the Riku-u-Kaido, running north from Tokio. These highways are well built, but very narrow, as they were intended for foot passengers, passengers in jinrikishas and kagos (chairs), and single horses without vehicles. The importance of these highways has departed now and they are used only as a means of local communication between certain towns.

RAILWAYS.

The following list, taken from a semiofficial publication, presents data as to the railways in operation and extensions of the same, those under construction, and those for which franchises were obtained at the last session of the Imperial Diet:

LINES IN OPERATION.

Name.	Miles.	Name.	Miles.
Government railways:		Kobu Railway:	
Tokyo-Kobe	376.31	Shinjiku-Hachioji	22.77
Ofuna-Yokosuka	10.03	Ryomo Railway:	
Obu-Taketoyo	12.01	Oyama-Maebashi	52.17
Maibara-Kanagasaki	31.01		
Nagahama-Fukatami	9.60	Osaka railways:	
Baba-Otsu	1.23	Osaka-Sakurai	29.10
Takasaki-Naoetsu	117.10	Oji-Nara	9.38
Total	557.29	Total	38.48
Nippon Railway Company:		Hankwai Railway:	
Tokyo-Aomori	454.66	Osaka-Sakai	6.13
Shinagawa-Akabane	12.76	Chikuho railways:	
Omiya-Maibashi	51.14	Wakamatsu-Iizuka	24.38
Utsunomiya-Nikko	25	Nokata-Kaneda	6.20
Iwakiri-Shiogama	4.23	Total	30.58
Uyeno-Akihanohara	1.15	Settsu Railway:	
Oyama-Mito	41.45	Amagasaki-Ikeda	8.35
Mito-Nakagawa	0.62	Iyo Railway:	
Shiriuchi-Hachinohe	3.30	Takahama-Hiraigawara	10.19
Total	594.31	Sanuki Railway:	
		Matugame-Kotohira	10.15
Sanyo railways:		Sangu Railway:	
Kobe-Mihara	143.40	Tsu-Miyagawa	23.58
Hiogo-Wadasaki	1.64		
Total	145.04	Hokkaido railways:	
		Temiya-Horonai	56.02
Kiushu railways:		Horonaibuto-Yakushunbetsu	4.39
Moji-Kumamoto	121.31	Mutoran-Sorachifuto	108.43
Tosu-Saga	15.30	Sunagawa-Utashinai	8.64
Total	136.61	Oiwake Yubari	26.49
		Total	203.97
Kwansei railways:		Kushiro Railway:	
Kusatsu-Yokkaichi	49.25	Shibecha-Atosanobori	25.78
Kameyama-Tsu	9.60	Sano Railway:	
Total	58.85	Kudzuo-Koshinagawa	9.50
		Grand total	1,933.75

LINES UNDER CONSTRUCTION.

Government railways:		Nanwa Railway:	
Fukushima-Aomori	298.26	Takata-Gojyo	16.40
Tsuruga-Toyama	123.58	Bantan Railway:	
Total	421.84	Shikama-Ikuno	29
Sanyo Railway:		Settsu Railway:	
Mihara-Hiroshima	45.29	Itami-Namase	6
		Boso Railway:	
Kiushu railways:		Sogano-Odzuna	11.39
Kumamoto-Matsuhashi	11	Nara Railway:	
Saga-Tsukasaki	17.60	Nara-Kyoto	26
Total	28.60	Kobu Railway:	
Kwansei Railway:		Shinjiku-Iidamachi	3.50
Yokkaichi-Nagoya	23.55	Ota Railway:	
Hoshiu Railway:		Ota-Mito	12.18
Gyohashi-Ikari	17.56	Sobu Railway:	
Kawagoe Railway:		Honjo Sakura	31.40
Kokubunji-Kawagoe	18.20	Nanyo Railway:	
Ome Railway:		Matsuyama-Gunnaka	6.57
Ome-Tachikawa	13.07	Dogo Railway:	
Osaka Railway:		Dogo-Asami and Matsuyama	3.06
Tennoji-Mimeda	6	Grand total	719.61

PROJECTED LINES.

Name.	Termini.	Distance.	Capital.
		Miles.	*Yen.*
Omi	Hikone, on the Tokaiko Railway, to Fukagawa, on the Kwansai Railway.	26	1,000,000
Hokuyetsu	Naoyetsu, on Government railway, to Nuttari, near Niigata.	98.45	3,700,000
Hatsuse	Nara to Sakurai	12.17	500,000

EXTENSIONS.

Name.	Extension.	Distance.	Estimated cost.
		Miles.	*Yen.*
Chikuho	Kotake to Sabukuro	3.32	123,590
Japan	Mito to Iwanuma	130	5,640,000
Bantan	Ikuno to Wadayama	13.40	500,000
Kwansai	Isuge to Nara	31.57	1,540,000
Chikuho	Iizuka to Usui	5	129,000
Do	Iizuka to Harada	15	1,224,834
	Iizuka to or Torisu	21	
Do	Iizuka to Yoshii	17	522,486
Iyo	Tachibana to Morimatsu	2	23,969

The main line and branches between Tokio and Kobe are owned and controlled by the Imperial Government. All other lines are owned and controlled by corporations or private persons under franchise from the Government. Since information is desired only as to main or through lines of traffic, the data herewith refers only to the continuous system of railways extending along the east coast, from Aomori, at the northern extremity of the main island of the Empire, to Tokio, and thence to the southern provinces.

On the Nippon Tetsudo Kaisha (Japan Railway Company), from Tokio to Aomori (454.66 miles), the principal points and distances

from Tokio are: Utsunomiya, 65¾ miles; Fukushima, 166 miles; Sendai, 215¼ miles; Morioka, 328 miles.

On the Government railway, from Tokio to Kobe (376.31 miles), the principal points and distances from Tokio are: Yokohama, 18 miles; Kodzu, 49 miles; Nagoya, 239.29 miles; Kioto, 329.20 miles; Osaka, 356.04 miles.

On the Sanyo Railway, from Kobe to Hiroshima (189.62 miles), the principal points and distances from Kobe are: Hineji, 34.05 miles; Okayama, 89.09 miles; Onomichi, 137.70 miles.

At present there is connection by means of small steamers plying across a portion of the Inland Sea, between Hiroshima and Moji, a port of the southern island, on the Straits of Shimonoseki; but surveys have been made for connecting Hiroshima by rail with Akamagaseki, a point on the Straits of Shimonoseki opposite Moji, the distance being 156.89 miles.

On the Kiushiu Railway, from Moji to Kumamoto (121.31 miles), the principal points touched and the distances from Moji are: Hakata, 47 miles; Kurume, 69¾ miles, with a branch from Tosu to Saga 15.30 miles long, which it is intended to extend to Nagasaki.

The Tanko Railway, a line 250 miles long, has been constructed and opened in the island of Yesso or Hokkaido, running from Otaru to Sapporo and on to interior points.

Those portions of the Government line lying between Tokio and Yokohama and between Kobe and Kioto have been constructed with double tracks. The standard gauge is 3 feet 6 inches; the roadbed is ballasted with stone and all culverts are constructed of stone; bridges are of steel in most cases, and steel rails are used, varying in weight from 52 to 63 pounds to the yard. The maximum grade for ordinary adhesion is 1 in 40. The lines are well managed and are apparently in good order. Communication is frequent between the larger cities, there being 22 trains daily each way between Tokio and Yokohama, and 14 trains between Kobe and Osaka and Kioto. On the other lines an average of 4 through and 5 local trains a day are run.

Freight charges on the Government lines are fixed according to the established classification of materials, at 2, 3, 4, 5, and 6 sen (1, 1½, 2, 2½, and 3 cents) per picul (133⅓ pounds) per mile for first, second, third, fourth, and fifth class, respectively, with right to give special rates, averaging about 2 sen (1 cent) per ton per mile, for car-load lots.

Passenger fares on the Government main lines are as follows per mile:

Class.	Sen.	Equivalent in United States currency.	Baggage allowance.
		Cents.	*Pounds.*
First	3	1.5	140
Second	2	1	80
Third	1	.5	40

On some of the branch lines fares are slightly higher. Charges on the private lines are approximately the same as those on the Government lines.

Parcel freight, or express, is carried on passenger trains at the following rates:

For any distance up to 25 miles	per picul (133⅓ pounds)	$0.50
For any distance from 20 to 50 miles	do	0.75
For any distance from 50 to 100 miles	do	1.00

And 25 cents for each additional 50 miles over 100.

Third-class passenger fare is limited by law to 1½ sen (¾ cent) per mile; but the highest third-class fare charged on any railway in Japan is 1.3 sen (6.5 mills) and the lowest 0.8 sen (4 mills) per mile.

The three greatest engineering works which have overcome natural obstacles are: (1) The Gotemba grade, on the Government railway, near Kodzu, between Yokohama and Kioto, where the line passes over the Hakone range of mountains, the ascent on the south side being 1 in 40 for a distance of 15 miles and on the north side 1 in 40 for a distance of 11 miles. (2) The construction of the line over the Usui Pass, on a branch or subsidiary line, a little northwest of Tokyo, there being an ascent of 1 in 15 for 7 miles, in which distance there are 26 masonry tunnels, and 9 canyons are crossed on steel and stone bridges, one bridge having 4 arches of stone. (3) The construction of the line in the Island of Yesso, at a point near Otaru, where for several miles it runs through a groove cut into the side of an almost perpendicular rock cliff overhanging the sea.

OCEAN LINES.

Most of the passenger and freight traffic and coasting business between the different open ports of Japan is handled by European and American steamship companies.

The Nippon Yusen Kaisha (Japan Mail Steamship Company) has by far the greater number of steamers and reaches most of the great ports of Japan, Vladivostok (Siberia), the ports of Korea and China, and all principal points between Yokohama and Bombay.

The Occidental and Oriental Steamship Company and the Pacific Mail Steamship Company, operating under combined schedules, run between San Francisco and Yokohama and the open ports on the eastern coast of Japan, and on to China.

The Canadian Pacific Steamship Company, starting from Vancouver, British Columbia, and the Northern Pacific Steamship Company, starting from Tacoma, Wash., make the same ports on the east coast.

The Peninsular and Oriental, the Messageries Maritimes, and the German Mail lines all run from points in China to Yokohama, touching at intermediate ports on the east coast of Japan.

The following table presents additional information as to the above-named steamship companies:

Name of company.	Control of company.	Ports entered in Japan.	Number of vessels.	Days between sailings.	Average gross tonnage.	Average horse-power.
Nippon Yusen Kaisha.	Partial control by corporation; annual Government subsidy, $880,000.	All principal ports.	65	1	.....	.....
Pacific Mail Steamship Co.	Corporation	Yokohama, Kobe, and Nagasaki.	4	20	4,289	.....
Occidental and Oriental Steamship Co.	Corporation	.....do	3	20	4,073	.....
Canadian Pacific Steamship Co.	Corporation; mail subsidy from British Government.	Yokohama, Kobe, and sometimes Nagasaki.	3	*a* 21 *b* 28	5,904	1,000
Northern Pacific Steamship Co.	Corporation	Yokohama, Kobe, and Nagasaki.	3	21	2,796	2,333
Peninsular and Oriental Steam Navigation Co.	Corporation; mail subsidy from British Government.	.....do	2	14	3,126	3,500
Compagnie des Messageries Maritimes.	French Government.	.....do	12	14	3,442	2,900
Norddeutscher Lloyds.	Corporation; mail subsidy from German Government.	.....do	1	28	3,207	2,200

a Summer. *b* Winter.

NOTE.—Steamers of the Pacific Mail and the Occidental and Oriental steamship companies run on joint schedule; the period between sailings is, therefore, about ten days. The steamers of the Peninsular and Oriental and Norddeutscher Lloyds companies run in connection with their respective main lines, transferring at Hongkong. Both lines run extra steamers when traffic requires it.

It would be useless to attempt to make any definite statement of the rates in force on the steamship lines, as they are generally a matter of individual arrangement and contract.

SUPPLEMENTARY REPORT.

I inclose herewith a recently published list of foreign steamers purchased and added to the Japanese merchant marine since the declaration of war between China and Japan, with their tonnage, gross and registered. Most of these steamers have been purchased by the Nippon Yusen Kaisha (Japan Mail Steamship Company), a private corporation operating under a subsidy granted by the Japanese Government.

Name.	Tonnage.		Name.	Tonnage.	
	Gross.	Registered.		Gross.	Registered.
Otaru-maru	2,374.30	1,507.44	Taiyo-maru	1,267.72	786.00
Kokura-mara	2,389.38	1,567.83	Yamaguchi-maru	3,033.67	1,910.74
Fusan-maru	2,362.00	1,541.00	Yamato-maru	3,067.03	1,656.20
Sakura-maru	2,818.99	1,827.45	Oyo-maru	1,892.00	1,173.17
Himeji-maru	3,008.00	1,940.00	Tateyama-maru	2,162.20	1,340.57
Ujina-maru	2,375.69	1,446.32	Kagoshima-maru	4,139.81	2,652.48
Shibata-maru	2,690.35	1,714,38	Anoura-maru	2,265.20	1,404.36
Fukuoka-maru	2,538.38	1,662.98	Kokwo-maru	542.70	336.48
Matsuyama-maru	2,958.68	1,934.03	Kinshu-maru	3,595.67	2,312.18
Toyohashi-maru	2,878.92	1,878.92	Riojun-maru	4,670.50	3,010.58
Izumi-maru	3,224.87	1,999.40	Tosa-maru	5,402.00	3,568.32
Soya-maru	1,725.62	1,069.89	Moji-maru	2,040.00	1,590.00
Iburi-maru	2,520.78	1,562.88	Jinsen-maru	2,189.81	1,411.32
Shinshu-maru	2,838.63	1,577.08	Gensan-maru	2,198.00	1,432.00
San-yu-maru	588.22	364.69	Tamahime-maru	2,035.68	1,570.76
Yedo-maru	1,670.00	1,036.00			
Doyo-maru	2,089.77	1,132.74	Total	81,554.67	51,599.67

N. W. MCIVOR,
Consul-General.

KANAGAWA, *January 23, 1895.*

KOREA.

There are no railways in Korea; neither are there any highways, mail lines, or other routes of communication, except mere bridle paths over which travelers ride on horseback or are carried in chairs by native porters. Nearly all freight is conveyed over these paths on the backs of men, ponies, and oxen, though ox carts of the clumsiest build are sometimes used; but these paths generally are impassable for wheeled vehicles.

The Nippon Yusen Kaisha (Japan Steamship Company) has a line of fine modern steamers, furnished with lights and all modern conveniences, which call at Fusan and Wonsan (Gensan), Korea, on their way to Vladivostok, Siberia. Another line of the same company has steamers running to Tientsin, China, which touch at Fusan and Chemulpo, affording good and ample accommodation for passengers and freight for Korean ports.

[In a later report, dated April 3, 1895, Consul Sill states that the service of the Nippon Yusen Kaisha to Korean ports has been discontinued since the commencement of hostilities between China and Japan, and while other Japanese steamers call frequently, the vessels are usually either transports or freight boats in some way connected with Japanese military operations.]

Other Japanese steamship companies maintain lines of freight ships over the same routes, and a Chinese company has a line of two small steamers plying between Shanghai and Chemulpo by way of North China ports.

On the river, between Chemulpo (the port) and Seoul (the capital), a distance by water of 56 miles, a number of small steam launches do duty, together with countless junks of every description.

All mails are carried by men.

JOHN M. B. SILL,
Consul-General.

SEOUL, *June 6, 1894.*

COCHIN CHINA.

OCEAN LINES.

The great through line for commerce and passenger traffic between Saigon and Europe and Saigon and Japan and intermediate ports is the Compagnie des Messageries Maritimes.

The termini are Marseilles and Yokohama, and the steamers touch at Alexandria, Port Said, Suez, Aden, Colombo, and Singapore, en route to Saigon. After leaving this port they touch at Hongkong, Shanghai, and Kobe, en route to Yokohama.

The total distance from Marseilles to Yokohama is 10,135 miles, viz: Marseilles to Saigon, 7,265; Saigon to Hongkong, 915; Hongkong to Shanghai, 870, and Shanghai to Yokohama, 1,085 miles.

The following nine steamers are at present performing the regular service between Marseilles and Yokohama:

Name.	Gross tonnage.	Horse-power.	Name.	Gross tonnage.	Horse-power.
Oceanien	4,259	3,400	Melbourne	4,080	3,400
Yarra	4,255	3,400	Natal	4,017	3,400
Sydney	4,232	3,400	Saghalien	4,050	2,900
Calédonien	4,232	3,400	Oxus	3,790	2,900
Salazie	4,255	3,400			

A steamer starts from Marseilles every alternate Sunday, and performs the passage to Saigon in about twenty-six days. The passage from Saigon to Yokohama takes twelve days.

The rates of passage for first-class accommodation (including fare and table wine) from Marseilles are:

To—	Francs.	Equivalent in United States currency.	To—	Francs.	Equivalent in United States currency.
Alexandria	350	$67.56	Saigon	1,550	$301.15
Port Said	400	77.20	Hongkong	1,715	330.96
Suez	450	86.85	Shanghai	1,715	330.96
Aden	875	168.88	Kobe	1,715	330.96
Colombo	1,200	231.69	Yokohama	1,715	330.96
Singapore	1.400	270.20			

Freight rates are: Marseilles to Saigon, 60 francs ($11.58) per ton of 1,000 kilometers (2,204.6 pounds).

E. SCHNÉEGANS,
Commercial Agent.

SAIGON, *January 1, 1895.*

PHILIPPINE ISLANDS.

RAILWAYS.

The Government assisted the construction of the only railway in these islands by making valuable concessions of land with right of way the entire length of the line, and by guaranteeing 8 per cent per year upon the stock of the road for the period of ninety-nine years, when it becomes the property of the State. So far (about three years) the road has paid more than 10 per cent per annum to its shareholders.

This railway, known as the Manila and Dagupin Railway, is single track, English gauge. It is very well built; steel rails are used the entire length; all bridges are of stone or iron or both, and the bed is well ballasted. The station buildings are very substantial.

The line runs from Manila to Dagupin, a distance of 123 miles. There are no large or important towns on the line except the termini mentioned, but small villages are numerous.

The equipment of the line is all of English make; the engines are small but well made; the cars are the usual English style, divided into first, second, and third class compartments. As the cars are all short, there is a great deal of swaying motion when the train moves at high speed. I am informed that one express train runs at the rate of 45 miles per hour, which is considered very fast in this country.

OCEAN LINES.

There is one line from Manila to Liverpool known as the Compañía Transatlántica, composed of three large steamers, averaging 4,500 tons and about 4,000 horsepower each. The average speed is 17 knots. This line maintains a monthly service to Europe, calling at Singapore, Colombo, Aden, Suez, Port Said, and Barcelona en route.

The passenger rates from Barcelona to the Philippine Islands, per the steamships of the Compañía Transatlántica, are:

To—	Rates.		
	First class.	Second class.	Third class.
Port Said	$77.20	$61.86	$30.88
Suez	86.85	69.48	35.04
Aden	168.88	135.10	67.55
Colombo	193.00	135.10	57.90
Singapore	265.38	193.00	115.80
Manila	243.54	291.78	127.38

The present rates of freights, per ton, from the Philippines to Liverpool, according to figures supplied by the agent of the company, are:

Articles.	Pesos.	United States equivalent.
Sugar, dry	65.00	$12.55
Coffee	80.00	15.44
Abaca	82.50	15.83
Copra	75.00	14.48
Cocoanut oil	75.00	14.48
Furniture, personal effects, books, etc	75.00	14.48
Gums and resinous products	75.00	14.48

NOTE.—Ten per cent is added to these rates when goods are sent to ports where transhipments take place.

Another line has been formed in Spain to compete with the Compañía Transatlántica.

This new company has for its agents in Barcelona the firm of Pinillos, Saenz & Co.; the agents here are Smith, Bell & Co. The first steamer is due here in August, when a great cut in freight rates is expected. It is unfortunate that this new line has no passenger accommodations, but as soon as arrangements can be made passenger steamers will be put on.

There are four lines of steamers between this port and Hongkong, and the passenger rate is $50 (Mexican) one way, and $80 for the round

trip. Freight rates vary from $10 to $20 per ton, according to the class of goods, but it is impossible to give correct rates, as they fluctuate greatly, and many shipments are made on special rates.

INTERISLAND AND COASTWISE TRADE.

There are many local lines of steamers plying between Manila and the provinces, the largest being the Compañía Maritima, which has twenty-eight steamers, with a total of 25,000 tons.

Ynchansta & Co. have two small steamers of 1,000 tons; S. P. Yanger, one small steamer of 500 tons; De la Rama & Bros., three small coasters of 500 tons; Aldecoa & Co., two coasters of 500 tons, and Armstrong & Sloan three small coasters of 400 tons.

The usual points touched by these steamers include all the ports in the Philippine group; also the Caroline and Marianas islands.

Passage and freight rates are by mutual agreement, but freight rates generally run from $2 to $5 per ton, according to distance. Rates of passage vary from $80 to the Carolines to $30 or $40 to Iloilo and Cebu.

Before the formation of the Compañía Maritima, which is a consolidation of several small companies, passage and freight rates were much less. The rates are now 33 per cent higher than before the formation of the new company.

Nearly all the steamers were built in England, and are very well adapted to this trade, which demands a good class of ships in order to withstand the severe weather during typhoon season. The steamers are all fitted with first and second class passenger accommodations, and are models of cleanliness. The officers and engineers are always European, the rest of the crew being composed of Chinese and natives. The steamers are not fast, seldom exceeding 12 knots per hour, but all are fitted with the latest improvements as to engines and boilers.

ISAAC M. ELLIOTT,
Consul.

MANILA, *July 1, 1895.*

AUSTRALASIA.

NEW SOUTH WALES.

OCEAN LINES.

Sydney is the metropolis not only of New South Wales but of Australasia. During 1893 there were 2,914 entries of vessels into Port Jackson (Sydney Harbor), with an aggregate tonnage of 2,590,371, and 2,916, with an aggregate tonnage of 2,602,957 tons, cleared; a grand total of 5,830 vessels, with a tonnage of 5,193,328 tons. Of these vessels over four-fifths were steam craft.

The following foreign steamship lines terminate at Sydney. All the Australasian lines also make this a terminal point:

Peninsular and Oriental Navigation Company.—The steamers of this line run between Sydney and London, touching at Melbourne, Aden, and Brindisi. There are twelve steamers, one leaving each alternate Monday. They are splendid vessels, having a total registered tonnage of 72,000, with 83,000 effective horsepower. They carry mails, passengers, and general freight. The voyage from Sydney to London averages forty-two days, and from London to Sydney forty-five days, although the direct mails and passengers, which change at Brindisi and thence proceed by rail, reach London in thirty-five days and return in thirty-seven days. The fare is from £60 to £70 ($291.96 to $340.62), and the freight rate is from £2 7s. to £2 10s. ($11.43 to $12.16) per ton.

Orient Line.—This company has nine large vessels, with a registered tonnage of 54,000 and 70,000 effective horsepower. The steamers run between Sydney and London, one leaving each terminal point on alternate Mondays. This gives a direct London mail and through passenger steamer every Monday. Vessels of this line make about the same time as those of the Peninsular and Oriental Line, and the fare and freight rates are about the same as of that company.

Messageries Maritimes.—This is a French line, having six very fine steamers, with an average tonnage of over 6,000 and about 7,000 effective horsepower, furnishing a monthly mail service to Marseilles. Fare and freight the same as by the two foregoing lines.

Norddeutscher Lloyds.—This company has seven fine steamers plying between Sydney and Amsterdam, one leaving Sydney each month, carrying mails and general passengers. The seven vessels have an aggregate of 32,200 tons capacity and 35,000 registered horsepower Through passenger and freight rates are the same as those of the three foregoing lines.

German Australian Steamship Line.—This company has seven steamers of an average of 3,500 tons, making 11 knots per hour. They are not calculated to carry mails or first-class passengers, but carry all classes of freight and steerage passengers. The service is monthly between Sydney and Hamburg. This line carries enormous quantities of wool, and before the general strikes crippled the Newcastle (New South Wales) mines they carried great quantities of coal. The voyage of these steamers usually takes fully forty-six days.

The route of all the foregoing lines is via the Suez Canal.

China Navigation Company.—This company has four iron steamers on the line between Hongkong and Sydney. They depart about once in eighteen days, the voyage occupying twenty-two days. The steamers have an average capacity of about 2,500 tons and about 3,000 horsepower. They carry mails and first-class passengers. The through fare is £33 ($160.58), and the through freight rate is about 25s. ($6.08) per ton.

Eastern and Australian Steamship Company.—These steamships run between Sydney and Hongkong. The company has four fine steamers, leaving about once a month. The vessels have an average of about 3,000 tons, and carry mails and all classes of passengers. Time of voyage averages twenty-two days. The through fare is £33 ($160.58).

Port Line.—This line consists of ten large steamers, aggregating 62,000 tons, running between Sydney and London. They are fine cargo steamers and make good runs, but have no stated time for departure, though it is regarded as a monthly service. The line has no subsidy, and carries no mails and but few first-class passengers, though fairly well fitted for the accommodation of a moderate number.

Oceanic Steamship Company.—This company has three excellent, though not large, steamers plying between Sydney and San Francisco. They are about 3,000 tons. Two of them are American-built ships and are splendid vessels for their size. Only these two small steamers among all that come to this great country carry the Stars and Stripes. The service is a monthly one, and the vessels carry mails, all classes of passengers, and general cargo. The steamers stop at Auckland, Apia, and Honolulu, and make the voyage in twenty-five days. The average fare is £40 ($194.64), and the freight rate 40s. ($9.73) per ton.

Canadian Pacific Steamship Company.—This company has two rather fine steamers of 3,500 tons plying between Sydney and Vancouver. The voyage occupies twenty-two days. The vessels carry mails, all classes of passengers, and general cargo. This, too, is a monthly service. The fare is £40 ($194.64), and the freight rate 40s. ($9.73) per ton.

White Star Line.—This company has three fine steamers plying between Sydney and London, via Cape of Good Hope. They are of about 3,500 tons and 3,000 horsepower, and carry general cargoes, mails, and all classes of passengers. The voyage occupies fifty days. They leave this port about once every six weeks.

Lund's Line.—This company has four new and good steamers running on the same route as the White Star Line and performing the same service with the same efficiency. The power and capacity of their vessels is about the same as those of the White Star Line. They leave this port irregularly about once a month.

Gibb Line.—This line consists of four iron steamers of about 3,500 tons and 3,000 horsepower, plying between Sydney and China and Japan. They carry mails and general passengers, averaging a trip about every six weeks.

The above are all the lines plying between Sydney and foreign ports.

The total tonnage inward and outward of this port for 1893, aside from the intercolonial traffic, was 4,513,676, over four-fifths of which was carried by these various lines of steamers.

INTERCOLONIAL LINES.

There are five lines of steamers, averaging nearly 3,000 tons, of 2,200 horsepower, running between Sydney and intercolonial ports, to wit, to Melbourne (Victoria), Adelaide (South Australia), Perth (Western Australia), Hobart (Tasmania), and Brisbane (Queensland). These five lines have seventy-two vessels, all iron, mostly of modern build and first class.

Adelaide Steamship Company.—This company has seventeen ships, one leaving Sydney every third day. They carry no mails, but all classes of passengers and general cargo. The fare to Melbourne is £1 5s. to £2 ($6.08 to $9.73); to Adelaide, £2 15s. ($13.38); to Brisbane, £1 to £2 ($4.86 to $9.72); to Perth, £7 10s. ($36.50). Freight charges vary very greatly according to class and activity of business.

Australian United Steam Navigation Company.—This company has thirty vessels, of about the same class and capacity as those of the Adelaide company. They make the same points as the former line and perform about the same service, with a branch also to Fiji. A steamer leaves Sydney about each alternate day.

Huddart-Parker Company.—This company has five steamers, of about the same class as those of the foregoing lines. One of their branches runs to Auckland and carries mails. The vessels are fitted up for general passenger service.

Howard Smith Company.—This company has about twenty steamers, of about the same class as the other intercolonial ships, which run from Sydney to Melbourne, Adelaide, Perth, Brisbane, and northern ports, leaving Sydney three times per week. They carry no mails.

Union Steamship Company.—This company has about twenty-five steamers, all first-class vessels of about 1,800 tons. They carry mails to Auckland, and leave Sydney twice a week.

The intercolonial traffic entered and cleared at Sydney in 1893 amounted to a grand total of fully 2,500,000 tons.

RAILWAYS.

All the "great through lines" of land transit are owned and operated by the Colonial Government. These public railways are substantial in construction, and are maintained in excellent condition. The shops, stations, depots, etc., are very different from those in the United States, but are well built, and answer the purpose for which they were constructed admirably.

The railroad mail service is quite efficient, and I think for safety and promptness in the delivery of mails there are few reasons for complaint.

The passenger service would hardly answer the demands of our people, but is quite satisfactory to the people here. There being practically no climatic disturbances, the trains are regular and accidents

very few. During several years the rate of casualties to persons was 0.4 killed and 2.5 injured per 1,000,000.

The passenger service, as far as comfort is concerned, is a little primitive, as the Continental coach is still used on the main lines, though there are a few Pullman sleepers, usually a little narrower than the American Pullman and but indifferently upholstered and fitted.

The freight cars—"goods vans"—are quite suitable for the trade. They are short trucks, with four open wheels, and with a capacity of 6 tons.

The public railroads are divided into three distinct systems, designated as the Southern, the Western, and the Northern. The railroads of this colony are of the standard gauge.

The Northern System runs north from Sydney, via Newcastle, to Wallangra, at the Queensland border a total distance of 491 miles, with a branch leading from Werris Creek to Narrabri, toward the interior, a distance of 90 miles.

The principal towns on this main line and the distances from Sydney are:

Town.	Miles.	Town.	Miles.
Gasford	50	Tamworth	281
Newcastle	102	Armadale	358
Singleton	147	Glen Innes	422
Murrundi	217	Jennings	491
Werris Creek	254		

On this line there is one through passenger train each day, and between Sydney and Newcastle three each day.

The Southern System runs in a southwesterly direction from Sydney to Albury, a distance of 386 miles. Albury is on the border of Victoria, and at this place the change is made for Melbourne. Owing to a change in the gauge, there are no "through trains," though they are called "through trains," as connections are made, losing only the necessary time for transferring mails, luggage, express matter, passengers, etc.

The main towns on this line and the distances from Sydney are:

Town.	Miles.	Town.	Miles.
Campbelltown	34	Cootamundra	253
Goulbourn	134	Junee	287
Yass	187	Wagga Wagga	309
Harden	228	Albury	386

There are two trains daily, with more frequent trains to points nearer to Sydney.

At Junee, 287 miles from Sydney, there is an important branch leading south to Hay, on the Murrumbidgee River, a distance of 125 miles, and 454 miles from Sydney. This point is the center of the famous

Riverina district, one of the best pastoral sections of New South Wales. It is almost exclusively devoted to the wool-growing industry.

This Southern System is by far the most important, not only as reaching the most productive country, but as leading to the important seaport of Melbourne, in the Colony of Victoria.

The Western System runs in a rather direct northwest course to the interior, terminating at Bourke, 503 miles from Sydney. Bourke is far in the interior, and is the center of a vast pastoral country and of a large wool trade, the wool being brought there for many miles by camel trains. It is claimed that the use of camels has made accessible much otherwise inaccessible country. When the seasons are not too dry, the pastoral products are taken from Bourke down the Darling River, via the Murray River, or by rail from Echuca to Melbourne.

The chief towns on this route and the distances from Sydney are:

Town.	Miles.	Town.	Miles.
Penrith	34	Orange	192
Mount Victoria	77	Dubbo	278
Wallerwang	105	Nyngan	397
Bathurst	145	Bourke	503
Blayney	172		

The road extends from Sydney in the direction of the Blue Mountains, the upper level of which it reached, above Emu Plains (36 miles), originally by a system of zigzag lines (called in the United States "a switchback"), and now by a direct line of s eep gradient which enables the locomotive to drag its heavy freight up the eastern slope of the mountains. The line runs along the top of the range until it descends into the valley by another and more important zigzag, the construction of which is regarded as a triumph of engineering skill.

MILEAGE, COST, FARES, FREIGHTS, ETC.

There is a total mileage of standard-gauge railroads in this Colony of 2,351, which is 1 mile for every 492 of the population, or 1 mile for every 128 square miles. Of this total all but 149 miles is single track. The cost per mile, open to traffic, was £14,743 ($71,740), and the aggregate cost, including equipment, was £34,657,571 ($168,643,740).

The cost of original construction, as well as of operation, was enhanced by the topography of the country, as there are 629 miles of grades varying from $1\frac{1}{4}$ to $3\frac{1}{3}$ per cent. The steepest grades, too, are on the southern and western main lines, over which most of the traffic passes. The railroad commissioners in their report state that the gradients are steeper and the curves sharper on the lines in this Colony than on the Alpine lines.

The passenger fares vary somewhat on the different systems, and instead of having a rate declining with distance they increase in some cases, especially outside the suburban area. As fares seem to be based,

in most cases, on mileage, I think the statement of rates can be made more comprehensive by giving fares at stated distances. On the Southern and Southwestern lines the fares are:

First 5 miles, 26 cents; 10 miles, 49 cents; 20 miles, 96 cents; 50 miles, $2.40; 100 miles, $4.74; 200 miles, $9.54; 500 miles, $20.22.

It will be seen that the average is above 4 cents per mile.

On the Northern and Northwestern systems and their branches the fares are:

First 5 miles, 18 cents; 10 miles, 30 cents; 20 miles, 60 cents; 50 miles, $2.34; 100 miles, $4.98; 200 miles, $9.84.

These are for first-class passage; the rate is one and one-half fare for round-trip tickets. There are also special rates for weekly and monthly tickets, with many holiday rates.

The freight charges are different in some respects on the various roads. On the Southern, from Hay to Sydney, the freight charges per truck (carrying 6 tons) are: For sheep, $41.84 for the through trip of 454 miles, and for cattle, $40.58; for wool, the average on the three classes on the same run is $18.11 per ton. The following table gives rates by a method which will enable an inquirer to make rather close calculations for all distances per truck for sheep:

Distance.	Sterling.			United States equivalent.
	£	*s.*	*d.*	
1 to 2 miles	0	15	4	$3.90
50 miles	1	13	4	8.14
100 miles	3	3	4	15.40
200 miles	4	18	9	23.91
300 miles	6	7	11	31.11
400 miles	7	6	3	35.58
500 miles	7	17	11	36.66

The average is about 5 cents per ton per mile. There are special rates for broken lots to agricultural fairs and for Sydney market days.

Freights are based upon a rather complicated classification. There are six classes, with six prices. Under the general head of "special classes" there are three subclasses, to wit: "Miscellaneous" and "A" and "B," and a "numeral," numbered first, second, and third. The miscellaneous covers cheap, bulky products, such as firewood, fire clay, flagging stones, straw, bones, coal, etc. Class A includes coarse vegetables, such as carrots, pumpkins, etc.; also roofing, tiles, heavy woods, etc.; and Class B includes such products as grain in sacks, poultry in coops, dairy products, etc.; while the first, second, and third subclasses include all classes of finer goods, the price varying with value and care necessary for safety and good order.

The following table will give a correct idea of rates in all classes:

Distance.	Special classes.			Numeral classes.		
	Miscellaneous.	A.	B.	First.	Second.	Third.
1 to 10 miles	$0.27	$0.48	$0.52	$1.14	$1.28	$1.56
25 miles	.62	.82	1.12	2.43	2.89	3.79
50 miles	1.16	1.46	2.13	2.61	5.57	7.55
100 miles	2.00	2.43	4.19	8.79	10.87	14.98
200 miles	3.65	4.54	7.62	16.09	19.74	27.62
300 miles	6.08	5.86	10.05	21.18	26.76	15.58
400 miles	7.30	7.22	12.49	26.28	32.69	45.51
500 miles	7.09	8.56	14.92	31.39	39.09	54.45

There is a rather complicated subspecial list of articles, with varied rates, but the above will convey a practical idea.

Freight trains vary in frequency with the different seasons and with change of business activity.

HIGHWAYS.

As the interior is reached by railway, there are no highways worthy of special mention.

GEORGE W. BELL,
Consul.

SYDNEY, *July 6, 1894.*

VICTORIA.

OLD AND NEW OCEAN SERVICE.

To the facilities which have been created for rapid and easy communication, both internal and external, the people are indebted in a large degree for the remarkable development of the Australasian colonies. Less than forty years ago, not a single mile of railway had been constructed in any one of the Australasian colonies; at the close of 1892, there were open no less than 12,571 miles of Government and private lines. In 1850, the arrival here of a steamer of more than 1,100 tons was looked upon as a great event; to-day vessels of 7,000 tons register are to be seen in all the great ports of Australasia.

The shipping trade of the colonies may truthfully be said to have progressed by leaps and bounds. Its importance is attested by the eloquent fact that the great maritime nations of Europe have opened up direct communication with the principal ports, and its magnitude may be gauged by the fact that the number of vessels which arrived at and departed from the various ports during the year 1892 was 17,512, having an aggregate tonnage of 17,213,970. But other and greater changes have been effected in the communication with the Old World than a mere increase in the size of the steamers or in the number of arrivals and departures. The opening of the Suez Canal caused

a complete revolution in the transoceanic services, and the remarkable progress which can be said to date from that great event has never since been allowed to come to a standstill, thanks to the enterprise of the great rival shipping companies, whose magnificent steamers ply between the ports of Australasia and Europe.

The continual improvements which are being made in naval architecture and engineering have enabled these companies to put on the Australasian service vessels which may be described as floating palaces, and whose rate of speed must seem little short of miraculous to such as remember the time when a voyage between the mother country and the southern colonies was seldom accomplished in less than one hundred days.

The first foreign trading vessel which arrived at Sydney, then the only Australian port, was the brigantine *Philadelphia*, flying the Stars and Stripes, November 1, 1792. Although the cargo brought by this vessel realized a high profit, foreign merchants were chary of forwarding cargoes to Australia because of the length of the voyage and the numerous sea risks, the voyage of the *Albion*, occupying three months and fifteen days from England to Sydney, being deemed a wonderfully rapid passage. With the progress of Australian settlement the number of ships arriving from Great Britain and other countries began to increase, and to meet the new development of trade various lines of clipper vessels were established by British firms, with the object of reducing as largely as possible the time occupied by the voyage. Among these, the Black Ball Line, so named from the distinguishing flag carried by the ships of Green & Co., of London, stood deservedly high. But just as the sailing vessels had reached the highest point of perfection possible with canvas alone, those propelled by steam power began to successfully rival them. The first steamer reaching Australia from England was the *Sophia Jane*, of 256 tons burden. She arrived at Sydney on May 16, 1831, and was intended for the trade between that port and Newcastle. Subsequently several attempts were made to establish a regular steam service between Great Britain and Australia, but the quantity of coal necessitated by the voyage round the Cape formed a serious obstacle. The establishment of the overland route, suggested by Lieutenant Waghorn, across the Isthmus of Suez aided in lessening the time occupied in reaching India from Europe, and indicated to the Peninsular and Oriental Steam Navigation Company the possibility of establishing regular steam communication with Australia, passengers and mails being transshipped at Alexandria or Suez. When the Suez Canal was opened, this company, which had finally obtained the contract for carrying the Australian mails, abandoned the system of transshipment across the Isthmus their vessels proceeding direct from Southampton to Aden, where the routes to Australia and India branched off. This prepared the way for the wonderful development

of the steam shipping trade between Europe and Australia, sailing vessels and some steamers still using the long sea route via the Cape of Good Hope or Cape Horn.

AMERICAN-AUSTRALIAN OCEAN LINES.

The continents of America and Australia are connected by two regular steamship lines, each being a monthly service, namely, the Oceanic Steamship Company, of San Francisco, and the Canadian-Australian Steamship Line, the former plying between San Francisco and Sydney, New South Wales, and the latter between Vancouver, British Columbia, and Sydney.

Oceanic Steamship Company.—The service of this company consists of three steamers, viz:

Name.	Tonnage.	Horse-power.
Monowai	3,433	3,000
Alameda	3,158	3,000
Mariposa	3,158	3,000

These vessels leave Sydney, Auckland, and Honolulu every four weeks, an almost daily service connecting Sydney with Melbourne and other Australian and New Zealand ports.

The steamers of the Oceanic service are exceptionally high class, with very fine passenger accommodation, and are of great speed. They are fitted with electric lights, and are especially adapted for tropical voyages, having ample ice chambers, the latter insuring a continuous supply of fresh provisions throughout the voyage.

Leaving Sydney, the steamers call at Auckland, Apia, Honolulu, and finally San Francisco, the length of the total line being 7,281 miles. The distances between the main points touched are Sydney to Auckland, 1,281 miles; Auckland to Honolulu, 3,900 miles; Honolulu to San Francisco, 2,100 miles.

The passenger rate (saloon) between Sydney and San Francisco is £40 ($194.66), and between the intermediate points as follows: Sydney to Auckland, $24.33; Auckland to Honolulu, $145.99, and Honolulu to San Francisco, $48.66, in either direction.

Freight, per ton, from Sydney to San Francisco is from £2 10s. ($12.16) to £3 ($14.59); from Sydney to Auckland, 15s. ($3.65), and from Auckland to Honolulu and San Francisco from £2 ($9.73) to £2 10s. ($12.16).

Canadian-Australian Line.—This company inaugurated, May 18, 1893, a monthly service, consisting of two vessels possessing every possible convenience and a high rate of speed. The two vessels of this service are:

Name.	Tonnage.	Horse-power.
Warrimoo	3 400	4,500
Arawa	5,026	5,000

The route is from Sydney to Vancouver, via Suva (Fiji Islands) and Honolulu, the length of the total line being 6,985 miles, and the distances between intermediate points: Sydney to Suva, 1,770 miles; Suva to Honolulu, 2,780 miles, and Honolulu to Vancouver, 2,435 miles.

The passenger rate (saloon) from Sydney to Vancouver, or vice versa, is £40 ($194.66), and freight rate £2 ($9.73) per ton. The rate between intermediate points is not quoted.

Although there exists no regular line of sailing vessels between America and Australia, the arrivals of such are numerous, the greater part of the merchandise from New York to Melbourne coming in that way.

EUROPEAN LINES.

Melbourne is connected with Great Britain and Europe by many lines of steam and sailing vessels, mail steamers leaving the port for London regularly every week.

The following are the most important companies whose vessels are engaged in the European-Australian trade:

Peninsular and Oriental Steam Navigation Company.—The history of this company practically dates from 1837, when Messrs. Wilcox and Anderson, in conjunction with Capt. Richard Bourne, founded the Peninsular Company, which, three years later, became the Peninsular and Oriental Steam Navigation Company. The strength of the portion of the company's fleet which is engaged in the Australian service is shown by the following table:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Himalaya	7,000	10,000	Carthage	5,013	5,000
Australia	7,000	10,000	Rome	5,011	5,000
Arcadia	6,362	7,000	Valetta	4,919	5,000
Oceana	6,362	7,000	Massilia	4,918	5,000
Victoria	6,268	7,000	Parramatta	4,771	4,500
Britannia	6,257	7,000	Ballarat	4,748	4,500

Passengers for Australia by these steamers may either make the through voyage from London to Adelaide, Melbourne, or Sydney, as the case may be, or they may cross the English Channel, via Dover and Calais or Folkstone and Boulogne, and join the steamers at Brindisi. There is also a branch service between Venice and Alexandria, touching at Brindisi, in connection with the mail services. The through steamers start every fortnight from the Royal Albert Dock or Tilbury, a special train leaving the Liverpool street station of the Great Eastern Railway to connect with each steamer. From Tilbury the steamer goes to Gibraltar, Malta, Brindisi, and Port Said, the northern entrance to the Suez Canal, arriving there about twelve days after leaving London. The steamer then proceeds by the Suez Canal to Suez, then through the Red Sea to Aden, then to Colombo, Ceylon, and next to Australia, stopping at King George Sound (Albany), Adelaide, Melbourne, and Sydney, which is the terminus of the line.

The total length of the line, London to Sydney, via the above ports, is 12,500 miles, and the distances between ports are:

From—	To—	Miles.
London	Plymouth	295
Plymouth	Gibraltar	1,054
Gibraltar	Malta	981
Malta	Brindisi	360
Brindisi	Port Said	930
Port Said	Aden	1,395
Aden	Colombo	2,093
Colombo	King George Sound	3,390
King George Sound	Adelaide	1,007
Adelaide	Melbourne	485
Melbourne	Sydney	560

The passenger rate (saloon) from London to Melbourne is from £60 ($291.99) to £70 ($340.65), and between ports as follows:

From—	To—	Fare.
London	Gibraltar	$48.66
Gibraltar	Malta	38.93
Malta	Brindisi	19.46
Brindisi	Port Said	53.53
Port Said	Aden	96.11
Aden	Colombo	81.51
Colombo	King George Sound	111.92
King George Sound	Adelaide	34.06
Adelaide	Melbourne	17.02
Melbourne	Sydney	17.02

Freight rates are liable to considerable fluctuation, and can only be named at the port of shipment and from steamer to steamer.

As indicative of the confidence the company has in the future development of the Australian trade, it may be mentioned that there is now building for this line a magnificent vessel of the highest class, and specially adapted for the requirements of the trade in which she is to be engaged. Her name is *Caledonia*, her tonnage 7,500, and she will have engines of 12,000 horsepower.

Orient Steam Navigation Company.—Early in 1877, the London firm of Anderson, Anderson & Co., perceiving that the time had come for founding a first-class steam line to Australia direct, commenced running with chartered steamers, and on the 7th of March, 1878, the *Garonne* left London flying the new flag of the Orient Steam Navigation Company, which had been formed by the united efforts of the firm above named and of F. Green & Co., also of London, who had joined them for the purpose. At first, only a monthly service was intended, but very soon it became plain that the traffic demanded fortnightly sailings, and to-day the service consists of the following splendidly equipped vessels:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Ormuz	6,031	8,500	Ophir	6,910	9,500
Oratava	5,552	7,000	Orizaba	6,077	7,000
Oruba	5,552	7,000	Oroya	6,057	7,000
Austral	5,524	7,000	Orient	5,365	6,000
Cuzco	3,918	4,000			

The route is the same as that pursued by the Peninsular and Oriental Company, with the exception that the Orient steamers call at Naples as well as at the other ports.

The service is a fortnightly one, and, with the Peninsular and Oriental Company, carries the British mails.

Gulf Line.—These steamers are owned by the Greenock Steamship Company, Limited, and the Gulf Line Association, Limited, Greenock, Scotland. Their first steamer sailed for Australia in 1880. The service is a regular one from London to Adelaide, Melbourne, and Sydney, via Cape of Good Hope, every month, and from Glasgow and Liverpool to Adelaide, Melbourne, Sydney, and Brisbane, also via Cape of Good Hope, every six weeks.

There are sixteen steamers, as shown below, having an average of 400 horsepower and attaining a speed of 12 knots:

Name.	Tonnage.	Name.	Tonnage.
Gulf of Genoa	3,448	Gulf of Bothnia	3,442
Gulf of Ancud	2,716	Gulf of Venice	3,021
Gulf of Corcovado	2,361	Gulf of Guinea	2,438
Gulf of Akaba	2,041	Gulf of Suez	1,535
Gulf of Mexico	3,088	Gulf of Trinidad	2,362
Gulf of Martaban	2,447	Gulf of Florida	2,906
Gulf of Lyons	2,661	Gulf of Siam	3,455
Gulf of Papua	1,971	Gulf of Taranto	3,500

The first-class fare from London to Melbourne is £45 ($218.99). Rates of freight on cargo from England to Australia vary from $4.86 to $7.29 per ton, and from Australia to England and the Continent from $8.51 to $14.59 per ton.

Lund's Line.—A monthly service, the terminal points of the line being London and Sydney and the intermediate points Adelaide and Melbourne. It consists of the following steamers:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Hubbuck	1,776	400	Wilcannia	1,750	450
Warrnambool	2,213	500	Bungaree	1,859	450
Culgoa	2,135	450	Yarrawonga	2,555	500
Woolloomooloo	2,221	500	Warrigal	2,778	500
Echuca	1,736	400			

Norddeutscher Lloyd.—This company was established at Bremen in 1856 for the purpose of running a line of steamers between Bremen, Hull, and London. Subsequently, lines were formed between Bremen and New York, the West Indies, and Brazil, and in 1885 the company received a subsidy from the German Government for the purpose of encouraging German commerce with Australia and eastern Asia. In 1886 the two last-named lines were opened.

The Australian service consists of the following steamers:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Kaiser Wilhelm II	7,000	6,500	Hapsburg	3,094	2,300
Elbe	4,510	5,600	Hohenzollern	3,092	2,300
Oldenburg	5,300	3,200	Braunschweig	3,079	2,200
Karlsruhe	5,347	3,300			

The terminal points of the line are Bremen and Sydney, and its total length is 13,105 miles. Leaving Sydney, the steamer proceeds to Melbourne, then Adelaide, Colombo, Aden, Suez, Port Said, Naples, Genoa, Southampton, Antwerp, and finally Bremen. The service is a monthly one, and the passenger rate (saloon) from Melbourne to Bremen is £60 ($291.99). No quotation is given as to freight.

Messageries Maritimes.—This company was created with the object of running subsidized postal services in place of the Government steamers.

The pioneer steamer of the Messageries Maritimes Company on the Australian line, the *Natal*, left Marseilles on the 23d of November, 1882, and reached Sydney on the 7th of January, 1883. From that time the service has continued without any interruption in a progressive manner.

The Australian service is from Marseilles to Noumea (New Caledonia), and consists of the following steamers:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Armand-Behic	6,548	7,000	Ville de la Ciotat	6,542	7,000
Polynesien	6,562	7,000	Tanais	1,824	1,600
Australien	6.653	7,000			

The service is a monthly one, and the total length of the line is 11,354 miles. Leaving Noumea (New Caledonia), the terminus of the line, the steamer calls at Sydney, Melbourne, Adelaide, King George Sound, Mahe, Aden, Suez, Port Said, and Marseilles, and vice versa. The distances between ports are:

From—	To—	Miles.
Noumea	Sydney	1,058
Sydney	Melbourne	576
Melbourne	Adelaide	480
Adelaide	King George Sound	1,025
King George Sound	Mahe	3,922
Mahe	Aden	1,395
Aden	Suez	1,308
Suez	Port Said	87
Port Said	Marseilles	1,503

Passenger rate (saloon), £65 ($316.32).

The line is under contract with the French Government to carry mails.

Anglo-Australasian Steam Navigation Company, Limited.—A monthly line of steamers from London to Australia, via Cape of Good Hope,

with terminus at Sydney. The intermediate ports are Adelaide and Melbourne.

The service consists of the following vessels:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Port Adelaide	2,751	400	Port Hunter	4,670	650
Port Albert	4,140	600	Port Melbourne	4,670	650
Port Caroline	3,528	600	Port Phillip	2,671	350
Port Chalmers	4,154	600	Port Pirie	3,109	450
Port Denison	3,506	650	Port Victor	2,793	400
Port Fairy	2,539	650	Hankow	3,594	500

China Navigation Company, Limited.—A monthly line of steamers from Melbourne to Hongkong, the intermediate ports being Sydney, Brisbane, Townsville, Cooktown, Thursday Island, and Port Darwin. The passenger rate (saloon) from Melbourne to Hongkong is £34 10s. ($167.89); freight rate, 35s. ($8.51). No quotation is given for intermediate ports.

The service consists of the following vessels:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Changsha	2,300	1,800	Taiynan	2,300	1,800
Chingtu	2,300	1,800	Tsian	2,300	1,800

Eastern and Australian Steamship Company.—A monthly line, consisting of the following vessels:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Catterthun	2,000	250	Airlie	2,000	340
Taunadice	2,000	300	Cutherie	2,000	300
Menmuir	2,000	240			

The route is via Sydney, and the terminal points of the line are Melbourne and Hongkong. The passenger rate (saloon) is £33 ($160.59), and the freight rate 40s. ($9.73) per ton.

Australian and India Line of Steamships.—An old-established line of steamers from Melbourne to Calcutta. The service is a monthly one, and the total length of the line is 6,000 miles. The passenger rate (saloon) from Melbourne to Calcutta is £25 ($121.66), and the freight rate 30s. ($7.29) per ton.

The service consists of the following vessels:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Daraus	3,283	260	Clitus	2,435	200
Argus	2,792	400	Bucephalus	1,818	147

The foregoing steamship lines are the most important connecting Melbourne with foreign ports, there being some smaller companies whose vessels run very irregularly, and are therefore not mentioned.

COASTWISE LINES.

The steam service between Melbourne and Sydney is practically continuous by the vessels of the Australasian United Steam Navigation Company (Huddart, Parker & Co.), the Adelaide Steamship Company (Howard Smith & Sons), and by the vessels of the Peninsular and Oriental Steam Navigation Company and other companies making Melbourne a port of call en route to and from Sydney. There is communication with Newcastle, New South Wales, by the steamers of Huddart, Parker & Co. and Howard Smith & Sons; with South and West Australia four or five times a week by the vessels of the Adelaide Steamship Company, the Australasian United Steam Navigation Company, and Huddart, Parker & Co.; with Brisbane and other Queensland ports by the vessels of the same companies and Howard Smith & Sons; with New Zealand once a week by the steamers of the Union Steamship Company, and with Tasmania by those of the Union Steamship Company and Huddart, Parker & Co. With the port of Geelong, 50 miles from Melbourne, a daily service of three vessels is maintained, and for Warrnambool, Port Fairy, and Portland, on the Victorian coast, vessels leave Melbourne three times a week.

The distances from Melbourne to the principal ports of Australasia are:

To—	Miles.	To—	Miles.	To—	Miles.
Sydney	560	Bowen	1,719	Fremantle	1,910
Newcastle	634	Townsville	1,822	Geraldton	2,242
Brisbane	1,074	Cooktown	2,028	Hobart	451
Rockampton	1,424	Adelaide	508	Wellington	1,479
Mackay	1,614	Albany	1,526	Suva	2,227

The passenger rate (first class) between Melbourne and the ports mentioned are:

To—	Fare.			To—	Fare.		
	Sterling.		United States equivalent.		Sterling.		United States equivalent.
	£	*s.*			£	*s.*	
Sydney	2	5	$10.94	Townsville	9	10	$46.22
Newcastle	2	5	10.94	Cooktown	12	0	58.39
Brisbane	4	10	21.89	Adelaide	2	5	10.94
Rockampton	7	10	36.49	Fremantle	6	0	29.19
Mackay	8	10	41.36	Hobart	2	10	12.16
Bowen	9	10	46.22	Wellington	8	10	41.36

The rates of freight fluctuate greatly, and exact figures can not therefore be given. They are, approximately, from Melbourne, as follows:

To—	Rate.		To—	Rate.	
	Sterling.	United States equivalent.		Sterling.	United States equivalent.
	Shillings.			*Shillings.*	
Sydney	5	$1.21	Cooktown	32	$7.78
Newcastle	5	1.21	Adelaide	8	1.94
Brisbane	10	2.43	Fremantle	18	4.38
Rockampton	20	4.86	Hobart	10	2.43
Mackay	23	5.59	Wellington	15	3.65
Bowen	30	7.29	Suva	30	7.29
Townsville	25	6.04			

The following is a list of the vessels engaged in the intercolonial and coastwise trade of Australia. These vessels are owned by the four companies of Huddart, Parker & Co., William Howard Smith & Sons, the Union Steamship Company, and the Australasian United Steam Navigation Company, and are in first-class condition.

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Adelaide	1,711	267	Manapouri	1,783	2,050
Albany	878	120	Moreton	581	250
Aramac	2,114	3,000	Mawhera	554	500
Arawatta	2,114	3,000	Maninapua	458	500
Arawata	1,098	1,250	Maranoa	1,505	2,400
Age	2,224	200	Nemesis	1,393	120
Australia	459	370	Ouraka	2,637	220
Brunner	540	700	Otway	563	93
Buninyong	2,070	300	Oonah	1,757	2,000
Barrabool	942	140	Ovalau	1,229	1,000
Burwah	982	200	Ohau	740	550
Barrier	2,036	200	Omapere	601	500
Bullara	1,725	250	Orowaiti	453	350
Burrumbeet	2,420	266	Oreti	219	200
Bulimba	2,513	2,000	Pukaki	1,444	700
Barcoo	1,505	2,500	Pateena	1,212	2,000
Birksgate	1,458	1,300	Poherua	1,175	600
Cintra	2,000	2,000	Penguin	824	850
City of Melbourne	838	900	Peregrine	1,660	450
Croydon	357	400	Perth	499	70
Coogee	1,000	250	Palmer	267	450
Courier	728	300	Quiraing	1,166	1,100
Colac	1,480	140	Rotokina	2,064	1,000
Corinna	1,279	1,200	Rotomahana	1,727	2,980
Dingadee	640	550	Ringarooma	1,096	1,250
Derwent	478	96	Rotorua	926	1,900
Despatch	237	90	Rosamond	721	450
Eurimbla	1,055	1,000	Rodondo	1,119	150
Elamang	1,000	900	Ranelagh	836	1,000
Elingamite	2,585	250	Rockton	2,000	2,000
Excelsior	340	160	Sophia Ann	400	35
Emu	616	95	South Australia	716	436
Era	2,379	250	Southern Cross	282	250
Edina	380	85	Tasmania	2,252	250
Ferret	445	90	Tambo	752	250
Flinders	521	90	Time	2,575	250
Flora	1,273	1,000	Talune	2,020	1,600
Franklin	730	284	Tarawera	2,003	1,750
Fitzroy	870	1,000	Taieri	1,668	750
Gunga	1,257	800	Te Anau	1,652	1,500
Gabo	2,060	300	Taviuni	1,465	1,000
Grafton	554	500	Takapuna	930	2,000
Glanworth	877	1,000	Taupo	737	550
Hauroto	1,988	1,250	Upolu	1,441	1,000
Hunter	310	120	Victoria	1,250	600
Hesketh	640	550	Victorian	718	436
Innamincka	2,501	460	Waihora	2,003	1,750
Janet Nicoll	779	500	Wakatipu	1,945	1,250
Katoomba	1,000	900	Wairarapa	1,786	2,050
Konoowarra	1,273	130	Wainui	640	755
Kawatiri	453	250	Wareatea	460	350
Leura	1,186	200	Wendouree	1,640	250
Lubra	321	60	Wadonga	2,500	3,300
Lindus	1,679	160	Waroonga	2,513	2,000
Monowai	3,433	2,800	Warrego	1,552	2,200
Mararoa	2,598	3,250	Yarralla	482	300

RIVERS.

The rivers of Victoria, with the exception of the Yarra from its mouth to the city of Melbourne, are very shallow and allow of navigation by vessels only of very light draft.

The intercolonial and coastwise steamers enter the Yarra and berth at the city wharves, a distance of 5 miles from the entrance. Foreign steamers usually land their passengers and cargo at the Williamstown and Port Melbourne piers, whence Melbourne is reached by rail.

The Murray River, which divides Victoria from New South Wales, is navigable by small vessels from Albury, in Victoria, to Goolwa, in South Australia, a distance of 1,468 miles. The most important places on the river between those points are Corowa, Cobram, Moama, Echuca, Perricoota, Swan Hill, Euston, Mildura, Wentworth, Gal Gal, Morgan, Murray Bridge, and Wellington.

The following are the largest vessels trading on the river:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Bantam	47	13	Resolute	39	9
Corrong	73	46	Rodney	133	13
Ellen	161	27	Rothbury	48	10
Gem	183	40	Success	96	7
Pearl	186	29	Trafalgar	158	13

These vessels carry passengers and cargo, the latter in considerable quantities, chiefly wool, wheat, and fruit. No quotation can be obtained in Melbourne as to rates for passengers and freight.

The Glenelg and Goulburn rivers are each navigable for about 80 miles, chiefly by pleasure boats.

RAILWAYS.

The length of line open for traffic in the Colony of Victoria at the close of 1893 was 2,975 miles, made up as follows: Northern System, 836¼; Western System, 1,018½; Northeastern System, 603¾; Eastern System, 500; South Suburban, 16½.

The number of passengers carried during the year was 58,445,075, and the tonnage of goods and live stock 3,386,888.

There are but two through lines of traffic from Melbourne, the Northeastern and Western lines. The Northeastern line, from Melbourne to Sydney, New South Wales, crosses the border at Albury, where, owing to the different gauges of the lines of the two colonies, cars must be changed. The distance from Melbourne to Albury is 191 miles, and from Albury to Sydney 386 miles, the total distance from Melbourne to Sydney being 577 miles. The track is a double one.

Trains leave Melbourne for Sydney twice a day, morning and evening, and the principal towns on the line to Albury are Wallan,

Seymour, Benalla, Wangaratta, Springhurst, and Wadonga. The distances between these places are:

From—	To—	Miles.	From—	To—	Miles.
Melbourne	Wallan	30	Wangaratta	Springhurst	14
Wallan	Seymour	31	Springhurst	Wadonga	27
Seymour	Benalla	60	Wadonga	Albury	4
Benalla	Wangaratta	25			

The first-class fare from Melbourne to Sydney is £4 1s. ($19.70), and 12s. 6d. ($3.04) extra if a sleeping berth is required. From Melbourne to Albury the fare is £1 14s. ($8.26).

The Western line, from Melbourne to Adelaide, is 483 miles in length, and, as in the case of the Northeastern line, the difference of gauge necessitates a change of cars at Serviceton, on the border of Victoria and South Australia and 287 miles distant from Melbourne. This line has a double track.

The principal towns between Melbourne and Serviceton are Bacchus Marsh, Ballarat, Ararat, Stawell, Murtoa, Horsham, and Dimboola. The distances between these are:

From—	To—	Miles.	From—	To—	Miles.
Melbourne	Bacchus Marsh	31	Stawell	Murtoa	36
Bacchus Marsh	Ballarat	43	Murtoa	Horsham	18
Ballarat	Ararat	57	Horsham	Dimboola	21
Ararat	Stawell	19	Dimboola	Serviceton	62

The distance from Serviceton to Adelaide is 196 miles.

The passenger rate from Melbourne to Adelaide is £3 15s. ($18.24), and from Melbourne to Serviceton £2 11s. 4d. ($12.48).

The rate of freight on the Victorian railways is 1½d. (3 cents) per ton per mile.

CANALS—HIGHWAYS.

There are no canals or highways in Victoria upon which any traffic worth mentioning is carried, the railways transporting all inland traffic.

DANIEL W. MARATTA,
Consul-General.

MELBOURNE, *January 1, 1894.*

NEW ZEALAND.

OCEAN LINES.

New Zealand Shipping Company—The head office of this company is in London, the registered office at Christchurch, New Zealand. London is the port of departure on the outward voyage, and either Wellington or Lyttleton on the return voyage. Vessels on the outward voyages, leaving London, call at the following places en route: Gravesend, Plymouth, Teneriffe, Cape Town, Hobart, Auckland, Wellington, Lyttleton, Port Chalmers, and Bluff.

The distance from London to Auckland on the outward voyage is 13,420 miles, divided as follows:

From—	To—	Miles.	From—	To—	Miles.
London	Gravesend	14	Teneriffe	Cape Town	4,450
Gravesend	Plymouth	296	Cape Town	Hobart	5,720
Plymouth	Teneriffe	1,420	Hobart	Auckland	1,520

Homeward-bound vessels from New Zealand to London call at Rio de Janeiro, Teneriffe, Plymouth, and Gravesend. The voyage by this route occupies two days less than the outward voyage, the distance from Auckland to London being 12,070 miles, viz:

From—	To—	Miles.	From—	To—	Miles.
Auckland	Rio de Janeiro	6,820	Plymouth	Gravesend	296
Rio de Janeiro	Teneriffe	3,520	Gravesend	London	14
Teneriffe	Plymouth	1,420			

The steamers of this company are considered first class, and are equipped with all modern improvements known to marine architecture. Experienced surgeons are always on board. Passenger accommodation is excellent, the cabins being lighted with electricity and heated by steam.

The following are the names of the company's steamers, with tonnage, horsepower, and first-class passenger capacity:

Name.	Tonnage.	Horse-power.	Passenger capacity.
Tongariro	4,163	3,600	64
Aorangi	4,163	3,600	61
Ruapehu	4,163	3,600	64
Kaikoura	4,474	4,000	76
Rimutaka	4,473	4,000	76
Ruahine	6,127	5,000	74

These are considered first-class passenger vessels, while the following-named vessels are regarded more as cargo than passenger steamers:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Tekoa	4,050	1,600	Duke of Westminster	3,726	2,000
Otarama	3,808	1,600	Duke of Buckingham	3,123	2,000
Waikato	4,766	1,600	Duke of Argyll	3,159	2,000
Duke of Sutherland	3,271	2,000	Duke of Devonshire	3,100	2,000

In addition to the foregoing, the company owns a fleet of ten sailing vessels, with a gross tonnage of 10,452.

The annexed table will show the frequency and regularity of the communication of this line between New Zealand, England, and the various intermediate ports already mentioned:

Sailing dates during 1894.

Outward.						Homeward.				
Leaves—		Due at—				Leaves New Zealand.	Due at—			
London.	Plymouth.	Teneriffe.	Cape Town.	Hobart.	New Zealand.		Rio de Janeiro.	Teneriffe.	Plymouth.	London.
Jan. 11	Jan. 13	Jan. 18	Feb. 3	Feb. 22	Feb. 26	Jan. 18	Feb. 10	Feb. 24	Mar. 1	Mar. 2
Feb. 8	Feb. 10	Feb. 15	Mar. 3	Mar. 22	Mar. 26	Feb. 15	Mar. 10	Mar. 24	Mar. 29	Mar. 30
Mar. 8	Mar. 10	Mar. 15	Mar. 31	Apr. 19	Apr. 23	Mar. 22	Apr. 14	Apr. 28	May 3	May 4
Apr. 5	Apr. 7	Apr. 12	Apr. 28	May 17	May 21	Apr. 19	May 12	May 26	May 31	June 1
May 3	May 5	May 10	May 26	June 14	June 18	May 17	June 9	June 23	June 28	June 29
May 31	June 2	June 7	June 23	July 12	July 16	June 14	July 7	July 21	July 26	July 27
June 28	June 30	July 5	July 21	Aug. 9	Aug. 13	July 12	Aug. 4	Aug. 18	Aug. 23	Aug. 24
July 26	July 28	Aug. 2	Aug. 18	Sept. 6	Sept. 10	Aug. 9	Sept. 1	Sept. 15	Sept. 20	Sept. 21
Aug. 23	Aug. 25	Aug. 30	Sept. 15	Oct. 4	Oct. 8	Sept. 6	Sept. 29	Oct. 13	Oct. 18	Oct. 19
Sept. 20	Sept. 22	Sept. 27	Oct. 13	Nov. 1	Nov. 5	Oct. 4	Oct. 27	Nov. 10	Nov. 15	Nov. 16
Oct. 18	Oct. 20	Oct. 25	Nov. 10	Nov. 29	Dec. 3	Nov. 1	Nov. 24	Dec. 8	Dec. 13	Dec. 14
								1895.	1895.	1895.
Nov. 15	Nov. 17	Nov. 22	Dec. 8	Dec. 27	Dec. 31	Nov. 29	Dec. 22	Jan. 5	Jan. 10	Jan. 11
			1895.	1895.	1895.		1895.			
Dec. 13	Dec. 15	Dec. 20	Jan. 5	Jan. 24	Jan. 28	Dec. 27	Jan. 19	Feb. 2	Feb. 7	Feb. 8

First-class saloon passage from London to any of the principal ports in New Zealand is £60 to £70 ($293.45 to $342.38), according to accommodation. I have not been able to ascertain the cost of transportation between intermediate points except from Auckland to Rio de Janeiro, which is $218.99.

The following tabulated statements will show the freight charges from London to New Zealand and vice versa. I wish to state, however, that these tables are not to be depended upon, for the reason that there is considerable competition for freight both ways, with the natural result that rates fluctuate almost every week.

Freight rates.

LONDON TO NEW ZEALAND.

Articles.	To Colony.	To London.
	s. *d.*	*s.* *d.*
Pig iron.....per ton weight..	30 0	25 0
Bar iron, bundles, bars, rods, sheet iron, pig lead, sash weights, cable chain, per ton weight.....	30 0	25 0
Galvanized iron, sheet lead, zinc in casks, tubes, bolts in casks, chain in casks, tool steel, wire, wire rope, hoop iron, nails, grindstones, shot, caustic soda, white lead, paints, tin and tin plates, copper and yellow metal, anchors, whiting, and chalk.....per ton weight..	32 6	27 6
Camp ovens, boilers, and pots (not singly).....do....	65 0	60 0
Salt.....do....	32 6	27 6
Slates and bricks.....do....	35 0	30 0
Sugar in bags.....do....	40 0	35 0
Rice in bags.....do....	50 0	45 0
Coffee in casks.....do....	55 0	50 0
Grease and palm oil.....do....	65 0	60 0
Arsenic.....do....	45 0	40 0
Superphosphates.....do....	32 6	27 6
Soda crystals and lump silicate of soda.....do....	50 0	45 0
Liquid silicate in drums.....do....	40 0	35 0
Bleaching powder, disinfecting powder, chloride of lime, per ton weight or measurement.....	50 0	45 0
Glucose and saccharine.....per ton weight or measurement..	35 0	30 0
Acids, naphtha, and other deck cargo.....do....	110 0	100 0
Cartridges, loaded.....do....	110 0	100 0
Barbed wire.....do....	35 0	30 0
Machinery and agricultural implements, ordinary packages, per ton weight or measurement.....	35 0	30 0
Machinery and agricultural implements, over 2 tons and not exceeding 3 tons, per ton weight or measurement.....	45 0	40 0
Thrashing machines, engines, heavy castings, and pieces of machinery, over 3 tons and not exceeding 4 tons.....per ton weight or measurement..	55 0	50 0
In crates: Earthenware, bottles, hollow ware, globes, and chimneys, per ton measurement.....	35 0	30 0
In bundles: Tubs, pails, buckets, sieves, spades and shovels, brooms and broom handles, oakum, cotton waste, flocks, stoves, bellows...per ton measurement..		
Rough furniture, rough toys, bales corks, rope, window glass, wire netting, per ton measurement.....	35 0	30 0
Hardware, bedsteads, safes, brushware, paints (packed) and dry colors, bales paper, Dundee bales, matting, floor cloth, oilman stores, blue stone, sulphur, tar, pitch, rosin, saltpeter, corn sacks, woolpacks, nuts in barrels, fruits, vinegar in cases or casks, mineral waters, cartridge cases, ranges in cases, loaf sugar, frames felt.....per ton measurement..	25 0	30 0
Malt, carpets, blankets, felt and straw hats, seeds, twine, varnish in cases, sheep nets, wines, cordials, and spirits in cases or casks, coffee, cocoa, chocolate, bicycles, tools, grindery, cases corks.....per ton measurement..	42 6	37 6
Drapery, tea, hops, saddlery, books, drugs, paper and stationery in cases, boots and shoes, confectionery, silk hats, musical instruments, sewing machines, plate glass, and measurement goods not otherwise enumerated, per ton measurement.....	45 0	40 0
Soda ash, potash.....per ton measurement..	40 0	35 0
Deals and flooring boards.....do....	30 0	25 0
Fuse, percussion caps, safety cartridges, and oilskins.....do....	60 0	55 0
Fireworks.....do....	70 0	65 0
Matches and vestas.....do....	35 0	30 0
Plants on deck.....do....	70 0	65 0
Wines and brandies in cases or casks, being transshipments from Bordeaux and Charente.....per ton measurement..	37 6	32 6
Sheep wash:		
Powder.....per ton measurement..	35 0	30 0
Liquid in drums or casks.....per gallon..	0 5	0 4
Oil in drums, tins, or casks.....do....	0 4½	0 3½
Varnish in drums or tins.....do....	0 6	0 5
Turpentine, paraffin, methylated spirits, and liquid disinfectants.....do....	0 6	0 5
Beer in bulk.....per tun of 4 hogsheads or of 6 barrels..	60 0	55 0
Bottled beer:		
In cases.....per dozen..	1 1	0 11
In casks.....do....	1 5	1 2
Gunpowder:		
Loose.....per barrel..	10 6	9 6
Canister.....do....	14 6	12 6
Cement.....do....	4 6	4 0
Quicksilver.....per bottle..	5 0	4 6

NOTE.—All goods 10 per cent primage.

Freight rates—Continued.

NEW ZEALAND TO LONDON.

Articles.	Mail steamer.	Cargo steamer.	Sailer.
General cargo.	*s. d.*	*s. d.*	*s. d.*
Wool:[1]			
Greasy, dumped, per pound	0 5/32	0 5/32	0 1/32
Slipe, dumped, do	0 1/16	0 1/16	0 1/16
Washed, dumped, do	0 3/32	0 3/32	0 3/32
Sheepskins,[1] dumped, do	0 5/32	0 5/32	0 1/32
Rabbit skins, box pressed to 25 feet, or fluffies, dumped[2] to 25 feet, per pound	0 3/4	0 3/4	0 5/8
Hops:			
Dumped, per pound	0 5/32	0 5/32	.....
Undumped, do	0 1	0 1	.....
Rags, do	.....	0 3/4	0 1/2
Flax, dumped, per ton weight	100 0	85 0	75 0
Tallow and pelts, do	55 0	45 0	40 0
Leather basils, etc, do	60 0	60 0	50 0
Grass seed, do	90 0	80 0	70 0
Bones and horns:			
With liberty to shoot, do	.....	.....	25 0
In bags, do	.....	.....	35 0
Salted hides, do	.....	.....	30 0
Waste paper, do	70 0	60 0	50 0
Manganese, metal ore, quartz, etc, do	20 0	20 0	20 0
Fine measurement cargo, per ton measurement	50 0	50 0	40 0
Preserved meats and rough measurement cargo, do	40 0	40 0	35 0
Shells, do	50 0	45 0	35 0
Gold bullion, per ounce	0 4	0 4	.....
In cool chamber.			
Butter:[3]			
In kegs, per pound	0 5/32	0 5/32	.....
In boxes, do	0 5/32	0 5/32	.....
Cheese[3], do	0 5/32	0 5/32	.....
Fruit, prepaid, per case of 2 feet	4 0	4 0	.....
In freezing chamber.			
Butter, frozen before shipment, per pound	0 3/4	0 3/4	.....
Butter, frozen on board, do	0 1	0 1	.....
Hares, each	0 7	.....	.....

[1] Wool and sheepskins, undumped, ¼d. extra per pound.
[2] Fluffies, undumped, ⅛d. extra per pound.
[3] Freights payable in colony or London at shipper's option.

The through rate of freight on wool, etc., to Boston or New York is 3/16d. additional to London rates, and to Antwerp, Hamburg, Leghorn, Naples, Genoa, Palermo, Yorkshire, ⅛d. additional.

For pelts in casks, sausage skins in tierces or casks, and catgut in cases, the rate to New York or Boston is 20s. additional to London rates.

Primage, steamers, 10 per cent; sailers, 5 per cent.

All weights and measurements gross.

For carriage of gold coin and silver-lead bullion the rate is one-half of 1 per cent on declared value, and for valuables 2 per cent, without primage.

The rates on gum and copra are as arranged at Auckland.

The rate on rabbits is as arranged.

It is impossible to obtain any information of a reliable character as to the freight charges between intermediate ports. The competition is keen, and the several agencies appear to be afraid to disclose too much lest the others may secure some undue advantage in consequence. I can only learn in a general way that there is a slight increase in both freight and passenger rates for intermediate ports as compared with through traffic.

First-saloon passengers are allowed 40 cubic feet of baggage room for each adult. Packages intended for the cabin should not exceed 2 feet 6 inches by 1 foot 6 inches by 1 foot 2 inches. Baggage "wanted on the voyage" can be got at once a week.

Shaw, Savill & Albion Company, Limited.—The head office of this company is at No. 34 Leadenhall street, London; J. H. Potter, manager. Passenger steamers sail monthly from London for New Zealand, calling at Plymouth, Teneriffe, Cape Town, and Hobart. The steamers sail monthly from New Zealand, calling at Rio de Janeiro, Teneriffe, Plymouth, and London.

The distances by this route are:

Outward.			Homeward.		
From—	To—	Miles.	From—	To—	Miles.
Gravesend	Plymouth	291	Wellington	Cape Horn	4,400
Plymouth	Teneriffe	1,415	Cape Horn	Rio de Janeiro	2,350
Teneriffe	Cape Town	4,585	Rio de Janeiro	Teneriffe	3,490
Cape Town	Hobart	5,660	Teneriffe	Plymouth	1,415
Hobart	Wellington	1,300	Plymouth	Gravesend	291
Total		13,251	Total		11,946

The vessels of this company are of modern build and are well maintained in every respect. They are fitted with electric lights, electric bells, pianofortes, libraries, refrigerators, bathrooms, heating appliances, etc.

The following are the names, tonnage, horsepower, and lengths of the vessels in this fleet:

Name.	Tonnage.	Horse-power.	Length.
			Feet.
Gothic	7,730	5,000	490
Ionic	4,753	3,000	440
Doric	4,784	3,000	440
Coptic	4,448	3,000	431
Tainui	5,031	5,000	440
Arawa	5,026	5,000	440

The above are used as passenger, mail, and cargo boats, while the following are used altogether as cargo boats:

Name.	Tonnage.	Name.	Tonnage.
Matatua	3,322	Pangataira	4,045
Pakeha	4,331	Maori	5,200
Mamari	3,583		

The carriage of cargo is confined mainly to direct shipments from London to New Zealand and vice versa, although shipments are taken from London to Cape Town and Hobart, and from New Zealand to Rio de Janeiro. I can not obtain the rates of freight between intermediate points, but the through rates are substantially the same as those quoted for the New Zealand Shipping Company. This company has agents at all ports of call and at all places of importance in New Zealand.

Sailing dates during 1894.

OUTWARD.

Steamer.	Leave—		Due at—			Due in New Zealand.
	Gravesend.	Plymouth.	Teneriffe.	Cape Town.	Hobart.	
Arawa	Jan. 25	Jan. 27	Feb. 1	Feb. 16	Mar. 7	Mar. 12
Doric	Feb. 22	Feb. 24	Mar. 1	Mar. 16	Apr. 4	Apr. 9
Ionic	Mar. 22	Mar. 24	Mar. 29	Apr. 13	May 2	May 7
Tainui	Apr. 19	Apr. 21	Apr. 26	May 11	May 30	June 4
Gothic	May 17	May 19	May 24	June 8	June 27	July 2
Arawa	June 14	June 16	June 21	July 6	July 35	July 30
Doric	July 12	July 14	July 19	Aug. 3	Aug. 22	Aug. 27
Ionic	Aug. 9	Aug. 11	Aug. 16	Aug. 31	Sept. 19	Sept. 24
Tainui	Sept. 6	Sept. 8	Sept. 13	Sept. 28	Oct. 17	Oct. 22
Gothic	Oct. 4	Oct. 6	Oct. 11	Oct. 26	Nov. 14	Nov. 19
Arawa	Nov. 1	Nov. 3	Nov. 8	Nov. 23	Dec. 12 1895.	Dec. 17 1895.
Doric	Nov. 29	Dec. 1	Dec. 6 1895.	Dec. 21 1895.	Jan. 9	Jan. 14
Ionic	Dec. 27	Dec. 29	Jan. 3	Jan. 18	Feb. 6	Feb. 11

HOMEWARD.

Steamer.	Leave New Zealand.	Due at—			
		Rio de Janeiro.	Teneriffe.	Plymouth.	Gravesend.
Tainui	Feb. 8	Mar. 2	Mar. 15	Mar. 20	Mar. 21
Gothic	Mar. 8	Mar. 30	Apr. 12	Apr. 17	Apr. 18
Arawa	Apr. 5	Apr. 27	May 10	May 15	May 16
Doric	May 3	May 25	June 7	June 12	June 13
Ionic	May 31	June 22	July 5	July 10	July 11
Tainui	June 28	July 20	Aug. 2	Aug. 7	Aug. 8
Gothic	July 26	Aug. 17	Aug. 30	Sept. 4	Sept. 5
Arawa	Aug. 23	Sept. 14	Sept. 27	Oct. 2	Oct. 3
Doric	Sept. 20	Oct. 12	Oct. 25	Oct. 30	Oct. 31
Ionic	Oct. 18	Nov. 9	Nov. 22	Nov. 27	Nov. 28
Tainui	Nov. 15	Dec. 7 1895.	Dec. 20 1895.	Dec. 25 1895.	Dec. 26 1895.
Gothic	Dec. 13	Jan. 4	Jan. 17	Jan. 22	Jan. 23

From London to New Zealand, the passenger rate for best first-class cabins is $357.68, and $309.01 for second class. These rates include Adelaide, Melbourne, Sydney, and Hobart. From New Zealand ports to Rio de Janeiro the fare is $218.99, and from New Zealand to London, via Rio, $357.68 and $309.01, according to cabin accommodation.

First-class passengers are allowed 40 cubic feet of space for personal baggage. Packages intended for use in the cabin should be marked "cabin," to avoid inconvenience. Such packages should not exceed 2 feet 6 inches long by 1 foot 6 inches broad and 1 foot 2 inches high.

The passenger accommodations of this line are excellent in every respect.

Shire Line.—The head officers of this line are located at No. 112 Fenchurch street, London, and in Dunedin, New Zealand. Turnbull, Martin & Co. are the managers. The vessels are specially constructed for the carriage of frozen meat between Australia and New Zealand and the United Kingdom. Their sailings are not according to any time-table, but a monthly service homeward is maintained. Outward movements largely depend upon the condition of the freight market for Australasian ports.

The port of departure in New Zealand is usually Port Chalmers; occasionally Wellington. The vessels call at Auckland, Wellington, Lyttelton, and Port Chalmers, in this colony. The outward route is via Cape of Good Hope, calling at Adelaide, Melbourne, Sydney, Brisbane, and Rockhampton, and thence to New Zealand ports, proceeding homeward via Cape Horn, calling at Las Palmas (Canary Islands).

Besides frozen meat, these vessels carry dairy produce, wool, etc., and are fitted with all the latest appliances, including electric lights, etc., and have refrigerating machinery in duplicate on the chemical principle, capable of dealing with 2,400 tons of frozen meat. The vessels are intended more for cargo than passenger traffic, but what passenger accommodation there is is first class.

There are seven vessels in this fleet, viz:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Elderslie	2,761	1,800	Perthshire	6,640	3,500
Fifeshire	3,719	2,400	Buteshire	6,640	3,500
Nairnshire	3,720	2,500	Banffshire	6,800	3,500
Morayshire	3,822	2,500			

First-class passenger fare from final port of departure in New Zealand is $170.32 net. No intermediate or steerage passengers are carried.

The freight rates for general cargo are the same as already quoted. The freight rates for frozen meats per pound, with 10 per cent primage, are: Mutton, 1d. (2 cents); lambs, $1\frac{1}{8}$d.; beef, $\frac{7}{8}$d.

The other lines mentioned also carry frozen meat at substantially these rates.

The *Perthshire*, *Buteshire*, and *Banffshire* are the largest freight carriers in the Australasian trade, each having 401,000 cubic feet available for cargo and 1,650 tons coal space in addition. The cool chambers have a capacity of 2,350 tons of beef or mutton, and the other space is equivalent to 10,000 bales of wool.

Oceanic Line.—This is an American line, registered at San Francisco. J. D. Spreckles & Co., 732 Market street, San Francisco, are the agents and owners. There are three vessels, one of which is registered in New Zealand. They run between Sydney and San Francisco every four weeks, as follows: From Sydney to Auckland, usually in four and a half days; Auckland to Apia, six days; Apia to Honolulu, seven days; Honolulu to San Francisco, seven days.

The distances sailed are:

From—	To—	Miles.
San Francisco	Honolulu	2,100
Honolulu	Samoa	2,000
Samoa	Auckland	1,950
Auckland	Sydney	1,282
Total		7,332

The Oceanic, or Frisco route, as it is popularly called in these colonies, affords every comfort and satisfaction to the traveling public.

It may be observed that the people of Australia, and more especially of New Zealand, are clamorous for faster vessels and more frequent communication with the United States. The growing friendship and ever-increasing commercial intercourse with these colonies demand a more generous effort on our part if we would continue to cultivate the kindly sentiment that exists at present and thereby extend our influence and commerce.

The following are the vessels engaged in this service:

Name.	Tonnage.	Horse-power.
Alameda	3,000	3,000
Mariposa	3,000	3,000
Monowai	3,500	3,000

The *Monowai* is owned by the Union Steamship Company, of Dunedin, New Zealand.

The rate of fare from San Francisco to Sydney is $200; from San Francisco to Honolulu, $75, and from Honolulu to Apia (Samoa) or Auckland, $200.

It will be seen from these figures that it costs as much from San Francisco to Samoa as it does to Sydney, although it is 3,232 miles farther to the latter place.

Freight from San Francisco to Auckland or Sydney is charged at the rate of $16 per ton.

SAILING SHIPS.

There is a line of sailing vessels controlled by Arnold, Cheney & Co., of New York, which leave that port once a month regularly for New Zealand points.

Freight is charged at the rate of $7 to $8 per ton, and one hundred to one hundred and ten days is an average voyage from New York to New Zealand.

The foregoing list includes all the foreign lines trading to this country.

COAST LINES.

Union Steamship Company.—This company, with head office at Dunedin, practically controls the entire water carriage of this colony, including intercolonial traffic, there being but one steamer in opposition for both colonial and intercolonial trade, with the exception of a local company at Auckland, with vessels trading to a few ports contiguous to this city.

The total length of the main line is as follows:

From—	To—	Miles.
Auckland	Napier	375
Napier	Wellington	203
Wellington	Lyttelton	175
Lyttelton	Port Chalmers	190
Port Chalmers	Bluff	132
Total		1,075

The larger proportion of the Union Company's fleet is in good condition. The best passenger vessels are of comparatively modern architecture and are equipped with electricity and other modern appliances.

The fleet of this company consists of fifty-one steam vessels of all sizes, with a gross registered tonnage of 56,693 and 42,505 horsepower, as follows:

Name.	Tonnage.	Horse-power.	Name.	Tonnage.	Horse-power.
Monowai	3,433	2,800	Rotorua	926	1,900
Mararoa	2,598	3,250	Penguin	824	850
Tekapo	2,439	1,500	Janet Nicoll	779	500
Rotokino	2,064	1,000	Ohau	740	550
Talune	2,020	1,600	Taupo	737	550
Tarawera	2,003	1,750	Rosamond	721	450
Waihora	2,003	1,750	Wainui	640	755
Hauroto	1,988	1,250	Dingadee	640	550
Wakatipu	1,945	1,250	Omapere	601	500
Wairarapa	1,786	2,050	Moreton	581	250
Manapouri	1,783	2,050	Mawhera	554	500
Oonah	1,757	2,000	Grafton	554	500
Rotomahana	1,727	2,980	Brunner	540	700
Taieri	1,668	750	Wareatea	460	350
Te Anau	1,652	1,500	Australia	459	370
Taviuni	1,465	1,000	Mahinapua	458	500
Pukaki	1,444	700	Orowaiti	453	350
Corinna	1,279	1,200	Kawatiri	453	350
Flora	1,273	1,000	Southern Cross	282	250
Ovalau	1,229	1,000	Oreti	219	200
Pateena	1,212	2,000	Moa	188	200
Poherua	1,175	600	Manawatu	183	150
Upolu	1,141	1,000	Beautiful Star	177	150
Arawata	1,098	1,250	Maori	174	300
Ringarooma	1,096	1,250	Waihi	92	100
Takapuna	930	2,000			

Vessels leave Auckland for the several principal ports at least twice a week regularly; sometimes as many as three vessels are dispatched weekly for southern ports. The communication is frequent, satisfactory, and regular, and the accommodation almost all that could be desired, the fares alone being the principal cause of complaint.

The people of the colony have been murmuring for a long time in consequence of the high rates of fares and freights charged by this comany. First-class fare from Auckland to Wellington until recently was $15.80; Wellington to Lyttleton, $6.07; Lyttleton to Dunedin, $6.07, and Dunedin to Bluff, $4.86.

Freight from Auckland to Wellington, $3.65 per ton, the same rate being charged from the latter port to Lyttleton and thence to Dunedin and the Bluff. Through rates from Wellington to the Bluff are charged at the rate of $4.86 per ton, while, so far as I can learn, $3.65 per ton is the ordinary rate between intermediate points.

INTERCOLONIAL LINES.

Union Steamship Company.—During the summer months this company dispatched one vessel weekly from Auckland to Sydney, one from Wellington to Sydney, and one via southern ports for Melbourne. In winter the service is generally reduced to one vessel fortnightly between Auckland and Sydney and Wellington and Sydney.

Now, thanks to opposition, the service is more frequent and regular, and the fares are materially reduced.

First-class fare from Auckland[1] to Sydney is $24.33; to Hobart, $48.66; to Melbourne, $12.16; to Levuka (Fiji), $41.35; and to Samoa, $60.

The distances are:

From—	To—	Miles.
Auckland	Sydney	1,282
Bluff	Hobart (Tasmania)	930
Hobart	Melbourne	451
Auckland	Levuka (Fiji)	1,172
Suva (Fiji)	Melbourne	2,227
Auckland	Apia (Samoa)	1,950

The service to Apia is once a month by this line, but the San Francisco mail boats call there both ways, which really makes the service fortnightly.

Huddart, Parker & Co.—The head office of this company is in Melbourne. At present this firm has but one vessel in the colonial and intercolonial trade. The steamship *Tasmania* sails from Sydney every twenty-eight days for Auckland direct, thence to Napier, Wellington, Lyttleton, and Dunedin, returning by the same ports to Sydney. The distance between these ports has been already mentioned. The *Tasmania* is a powerful and splendidly appointed steamer, well ventilated and fitted with every modern appliance, including electricity. She is of 2,252 tons register and 2,500 horsepower.

The freight and passenger rates are the same as the Union Company charge.

It is to this company that the people of the colony are indebted for reduced rates, now fully 50 per cent less than before its service was established.

There are other local steamship companies in the colony, but their routes are confined to the small trading stations along the coast, rivers, and bays.

RAILWAYS.

The railways of this country are owned, controlled, and operated by the Government, with one exception, viz, the Wellington and Manawatua Railway. The fares and freights upon this line are the same as those charged upon the Government road.

[1] The first-class fare by this company's boats has been reduced to $4.86 from Auckland to Sydney in consequence of opposition.

The railways of the colony are in good condition, the roadbeds being well ballasted and kept in good repair. The rolling stock is also in good order, but the time is exceedingly slow; the average speed for first-class trains does not exceed 16 miles per hour. The longest continuous overland trip by rail is from Christchurch to Invercargill, 369 miles.

The following are the distances and first class fares between the main points reached by rail in the colony:

From—	To—	Miles.	Fare.
Christchurch	Invercargill	399	$23.57
Do	Dunedin	230	11.65
Napier	Wellington (the capital)	200	9.97
New Plymouth	do	253	11.96
Auckland	Rotonia	172	18.29

The mileage represented embraces only about 1,000 of the nineteen hundred and odd miles operated in the colony, but the remainder is principally made up of branches running into the interior to small towns, coal mines, etc.

The following are the rates of freight charged on the principal products of the country for a given number of miles:

Articles.		Miles.	Rate.
Grain, flour, and potatoes	per ton	140	$3.22
Do	do	250	3.79
Sheep or cattle	per car, single deck	140	14.53
	per car, double deck		16.65
Live stock	do	250	17.93
			20.00
Do	do	370	27.28
			30.40
Wool, undumped	per ton	140	2.00
Do	do	230	2.45
Do	do	370	3.16
Wool, dumped, double bale	do	140	3.50
Do	do	230	4.38
Do	do	370	10.63

The rates for coal are:

Miles.	Inferior.	Superior.	Miles.	Inferior.	Superior.
	Per ton.	*Per ton.*		*Per ton.*	*Per ton.*
50	$1.31	$1.86	200	$3.10	$3.44
100	1.92	2.47	250	3.44	4.07
150	2.43	2.87			

The difference in the freights charged on inferior and superior coal is to afford the poorer quality an opportunity of competing with that which is regarded as superior.

I attach hereto a map of New Zealand, which shows the Government railways open for traffic, the private lines operated in the colony, the coach routes, roads, and tracks, and the steamer routes to and from the various ports.[1]

JOHN D. CONNOLLY,
Consul.

AUCKLAND, *June 28, 1894.*

[1] Map filed in Bureau of Statistics.

POLYNESIA.

NEW CALEDONIA.

OCEAN LINES.

The following were the services between Noumea and Europe and Australia, and on the coasts of this colony, on January 1, 1894:

(1) *From Marseilles to Noumea, via Australia.*—Four steamships of the Messageries Maritimes, viz, the *Polynesien*, *Australien*, *Armand-Behic*, and *Ville de la Ciotat*, all first-class passenger ships of over 4,000 tons.

(2) A steamer of 1,500 tons from Sydney to Fiji, via Noumea, monthly.

(3) Two steamers of 600 tons each, employed on the east and west coasts of this colony, belonging to a local syndicate.

The Messageries steamers are mail packets, and receive a subsidy from the French Government. The syndicate steamers are subsidized by the local treasury. The Australian steamers receive no State compensation.

All the interior traffic of the colony is done by the coasting steamers, the main roads inland not being yet completed.

There are no railways in the colony. Rates for first-class passage are: Marseilles to Noumea, 1,875 francs ($361.87); round-trip ticket, 3,000 francs ($579); Sydney to Noumea, 250 francs ($48.25); round-trip ticket, 375 francs ($72.38).

L. LE MESCAM,
Vice Commercial Agent.

NOUMEA, *July 14, 1894.*

FIJI ISLANDS.

OCEAN LINES.

United Steam Navigation Company, Limited.—This line has its head office in Brisbane, and a branch office at Sydney, where Burns, Philp & Co., Limited, are agents.

This company runs a branch steam service making fortnightly trips from Sydney to the ports of Suva and Levuka, Fiji Islands, bringing the English and Australian mails, passengers, and freight through to this colony.

The vessels en route for Sydney call at Noumea, but on their return trip from the Fiji Islands to Sydney they only call at Noumea on alternate trips.

Noumea is the capital of New Caledonia and distant from Sydney about 1,060 miles.

There is good anchorage alongside of the wharf at Noumea. Johnston is the agent for the company here.

The New Caledonian group has a population, civil and military, of 6,323; convicts, 11,368; native population, including Loyalty Islands and Isle of Pines, 40,750.

These vessels also call at New Hebrides every second Tuesday, connecting with branch steamer which proceeds around this group monthly. They leave for Sydney every fourth Sunday, and for Suva and Levuka (Fiji) every second Wednesday.

Suva is the capital of the Fiji Islands. The anchorage alongside of the wharf is good. The distance from the port of Noumea is about 760 miles.

The white population of the Fijis is about 2,000, and of natives and others about 120,000.

The company's service from the port of Suva to Noumea and Sydney is alternate Wednesdays, and to Levuka alternate Saturdays. At Levuka the vessels anchor alongside of the wharf. Levuka is distant from Suva about 60 miles, and from Sydney about 1,180 miles. J. C. Smith & Co. are agents at Suva.

There is a service from the port of Levuka to Suva, Noumea, and Sydney every second Wednesday, calling at New Hebrides every fourth Wednesday. J. C. Smith & Co. are agents at Levuka.

The condition of this line is very good, both as to passenger and freight accommodation. The steamers at present running are the *Birksgate* and the *Victoria;* tonnage, 1,458; horsepower, 1,300 and 1,257, respectively. Trips from Sydney to Noumea are made in four to five days; from Noumea to Suva in three and a half days, and from Fiji direct to Sydney in seven days.

Through rates of passage from Sydney to Suva and Levuka: Saloon, £12 10s. ($60.83); round trip, £20 ($97.32); steerage, £7 10s. ($36.50); round trip, £12 ($58.39). Twenty per cent off these rates to theatrical companies, commercial travelers, clergymen, and Sisters of Mercy. The baggage allowance is: Saloon passenger, 20 cubic feet; steerage passenger, 10 cubic feet. Return tickets are good for six months from date of issue. The company carries first and second class passengers, and the fares include table and attendance, berths, etc.

Through freight rates to Suva and Levuka from Sydney, 30s. ($7.30) per ton of 40 cubic feet on general cargo.

Passengers are allowed to stop at intermediate ports and continue the voyage by any steamer in which there may be accommodation.

INTERCOLONIAL LINES.

Union Steamship Company of New Zealand, Limited.—The head office of this company is at Dunedin, New Zealand; James Mills, managing director. It runs a fortnightly steam service from Auckland to the ports of Suva and Levuka, making connections at Auckland with the

Oceanic Line of steamers, thus bringing the English and American through mails, passengers, and freights to Fiji. The distance from Auckland to Suva and Levuka is 1,172 miles, and steamers run the same in four and one-half days, the half day being occupied in running from Suva to Levuka.

The steamers in this service are the *Taviuni* and the *Ovalau*, 1,465 and 1,229 tons and 1,000 horsepower each, respectively.

Freight rates to Auckland: Fruit, 20s. ($4.86); general cargo, 30s. ($7.30) per ton of 40 cubic feet; cocoanuts, per bag, containing about 100, 36 cents; peanuts, per bag, 48 cents.

Passenger rates to Auckland: Saloon, £8 10s. ($41.31); round trip, £15 ($72.90); steerage, Levuka and Suva to Auckland, £4 10s. ($21.87); round trip, £8 ($38.88). Luggage—saloon, 20 cubic feet; steerage, 10 cubic feet.

The steamer *Upolu* also makes a monthly connection with the port of Suva during the cane-crushing season, carrying cargoes of sugar, as well as passengers and mails, to Auckland. She belongs to the Union Steamship Company and runs regular monthly trips from Auckland to the Friendly Islands and Samoa, calling at the islands of Nukualafa, Haapai, and Vavaw.

A steamer runs monthly between Melbourne and Suva and Levuka; distance, 2,227 miles; running time, twenty-five days, allowing seven days' stay in Fiji. The vessel employed in this service is the *Towpo*, of 787 tons and 550 horsepower.

Freight rates: Fruit, 20s. ($4.86); general cargo, 30s. ($7.29) per ton of 40 cubic feet; flour, in 200-pound bags, 25s. ($6.07) per ton weight.

Rates of passage: Saloon, £12 10s. ($58.32); round trip, £20 ($97.20); steerage, £7 10s. ($36.45); round trip, £12 ($58.32).

For the company's inter insular service the steamship *Maori*, 174 tons and 200 horsepower, plies regularly between the islands of this group. Freight rates from 15s. to 20s. per ton.

The condition of the Union Steamship Company's service is considered very good, both as to passenger and freight accommodation. Passengers securing tickets for distant ports can remain at any intermediate port en route, such tickets being good for three months from date of issue. Holders of return tickets will be permitted to remain three months at the port for which they are booked. Children are booked at reduced rates. All classes of passengers are victualed by the company in a liberal way. Saloon passengers are provided with all accommodations, together with attendance of experienced servants.

The agent at Suva and Levuka is I. M. Duncan.

Canadian-Australian Line.—This line is controlled by Huddart, Parker & Co., who have a branch office at Sydney; Burns, Philp & Co., agents.

A monthly service is maintained between the ports of Victoria (British Columbia) and Sydney, calling en route both ways at Honolulu and Suva. The steamers on this service are the *Warimoo* and *Arawa*, of 3,326 and 5,026 tons, respectively. The time occupied in running between Victoria (British Columbia) and Suva is about seventeen days, and from Suva to Sydney about five days. The distance from Sydney to Suva is 1,770 miles; from Suva to Honolulu, 2,780 miles, and from Honolulu to Victoria, 2,435 miles.

The rates of passage from Sydney are:

To—	Saloon.		Fore cabin.
	Single tickets.	Round trip.	
Suva	$72.90	$121.50	$48.60
Honolulu	145.80	218.70	58.32
Victoria	194.40	243.00	77.76

Liberal arrangements made with families; children under 12 years (with families), half price; under 5 years and over 2 years, one-fourth fare; under 2 years, free, when no separate berth accommodation is required.

Saloon passengers have the option of stopping at any port of call between Sydney and Vancouver, or vice versa, and of resuming it within three months by a later steamer of the line having room. The cabins are provided with every requisite. The cuisine is excellent, fresh meat and poultry and fresh fruit and vegetables being supplied throughout the voyage.

First-class saloon passengers are allowed 40 cubic feet each adult for baggage; fore-cabin passengers, 20 cubic feet; children paying half fare, half these measurements. Any excess is charged for at the rate of 2s. 6d. per cubic foot. The rate for freight is £2 ($9.72) per ton of 40 cubic feet, general cargo.

CANALS, RAILWAYS, AND HIGHWAYS.

There are no canals or railway lines in this colony. Interisland and river traffic is done by small sailing craft and steam launches owned by private parties and the sugar companies.

The only approaches to macadamized roads are in the two principal towns of this colony, Suva and Levuka.

The great highway for these islands is the sea. The means of communication between the different plantations and the native towns overland are foot and bridle paths not worthy the name of roads usually running along the coast and banks of rivers.

BENJAMIN MORRIS,
Vice Commercial Agent.

LEVUKA, *January 1, 1895.*

TAHITI.

OCEAN LINES.

Notwithstanding the somewhat remote situation of Tahiti there are two important ocean lines having termini here.

American Line.—The older and the more important line is that between Tahiti and San Francisco, Cal. Three American steamers are engaged in the service, making regular monthly trips each way between the two ports. The Colonial Government of Tahiti has for a number of years granted to this service an annual subsidy of $15,000 for transportation of mails. These vessels must also call at Taiohoe, Marquesas Islands, on the down trip from San Francisco, to deliver mails.

The distance direct between Tahiti and San Francisco is 3,700 miles, and via Marquesas 4,000 miles. The usual average trip from San Francisco, via Taiohoe and Tahiti, is twenty-eight days, and from Tahiti to San Francisco, thirty-three days.

Although these vessels are only about 350 tons register, they are exceedingly comfortable, and the passenger accommodation is excellent.

Passenger rates: First-class, $90; second-class, $45.

Freight rates: From San Francisco, $8 per ton, and from Tahiti, $6 per ton. Agents at San Francisco, J. Pinet & Co.

New Zealand Line.—The British steamship *Richmond* has for a number of years made eleven trips per annum between Tahiti and Auckland, New Zealand, calling each way at the islands of Raiatea and Rarotonga. This vessel receives a subsidy of $4,000 per annum for transportation of mails.

The distance direct between Tahiti and Auckland is 2,400 miles; via Raiatea and Rarotonga, 2,550 miles. The average trip between Tahiti and Auckland is eleven days.

The *Richmond* is about 850 tons register, and accommodation for passenger service is good.

Passenger rates: First class, $100; second class, $60.

Freight rates: Both ways and to intermediate ports, $12 per ton.

INTERISLAND LINES.

Marquesas route.—The regular mail schooner between Tahiti and the Marquesas Islands, via the Island ot Fakarava, receives a Government subsidy of about $2,000 per annum.

The distance from Tahiti to Fakarava is about 180 miles, and to Taiohoe, Marquesas, 750 miles. Average trip from Tahiti to the Marquesas, fourteen days; return trip, eight days. This line includes calling each way at Fakarava.

Passenger rates: To Fakarava, first class, $9.50; second class, $4.50; to Marquesas, first class, $38.50; second class, $25.

Freight rates: To Fakarava, $5 per ton, and to the Marquesas, $6 per ton. The same rates are charged each way.

Gambia-Tubuai route.—This route was established several years ago. A small schooner is employed for the service, and receives a subsidy of $2,400 per annum for transportation of mails. This vessel makes six round trips a year. The distance between Tahiti and the Gambier Islands, via Tubuai, is about 900 miles.

I am unable to obtain any information regarding passenger and freight rates.

Moorea route.—There is regular weekly communication between Tahiti and Moorea, an island some 20 miles distant. This service is performed by a small steamer of about 70 tons register, which receives from the local government a subsidy of $1,560 per annum.

Passenger rate, $2; freight rate, $1.50 per ton.

The foregoing are the only regular routes of interisland communication at present established. All the principal islands of the colony can, however, be reached by the many trading schooners. It is impossible to state passenger and freight rates, much depending upon distance and other circumstances.

HIGHWAYS.

Tahiti has much to be proud of in the condition of its highways and roads. The so-called "Broom Road" nearly circles the entire island; it is 110 miles in length. This road, although narrow, being on an average 40 feet in width, is kept in excellent order, as are other roads in the town of Papute and the adjacent districts. On other islands there are also roads, the condition of which, however, can not be compared favorably with that of roads in Tahiti.

J. LAMB DOTY,
Consul.

TAHITI, *January 1, 1895.*

HAWAIIAN ISLANDS.

RAILWAYS.

The principal railway on these Islands is on the Island of Oahu, and runs between the city of Honolulu and Ewa Mill. It is controlled by a corporation, the Oahu Railroad and Land Company. The total length of the line is 23.3 miles, and it is well constructed and kept in excellent order. It is a single-track road. There are two passenger trains daily, each making the round trip between Honolulu and Ewa Mill.

The following table will show the passenger traffic on this road for the years 1891, 1892, and 1893:

Statistics of passenger traffic.	1891.	1892.	1893.
Number of passengers carried	103,644	92,794	82,633
Passenger earnings	$38,021.55	$29,204.20	$24,767.35
Number of passengers carried 1 mile	1,147,718	963,483	844,342
Average number of miles each passenger carried	11.07	10.38	10.21
Average receipts per passenger	$0.367	$0.314	$0.299
Average receipts per passenger per mile	$0.033	$0.03	$0.029
Average earning per mile of road	$2,055.22	$1,578.60	$1,338.77
Sources of passenger receipts:			
Commutation and 1,000-mile tickets	$3,671.00	$2,728.70	$2,697.95
Excursion	4,148.90	2,576.65	1,053.75
Regular passenger traffic	30,201.65	23,898.85	21,015.65
Total	38,021.55	29,204.20	24,767.35

The total amount of freight receipts for 1893 was $33,999.74, and the total freight moved during that period was 24,910 tons.

The equipment of the road available for service January 1, 1894, was as follows:

	Number.		Number.
Locomotives	3	Cattle cars	3
Passenger cars	6	Hand cars	4
Combination cars	2	Push cars	3
Excursion cars	6	Water car (capacity, 2,000 gallons)	1
Box cars	10	Land pile driver	1
Flat cars	3		

During the year 1894 two locomotives and a number of freight cars have been added to the rolling stock of this road.

It has been determined to extend the road 54 miles beyond Ewa Mill to Kahuku Plantation. Fifteen miles of the new road have been graded, to Waianae Plantation, and the ties and rails for this section have been purchased and are now in transit to that place.

The Kahului Railway, which transportation route of the Island of Maui has for its terminal points Paia and Wailuku, is 13 miles in length. Its equipment consists of 3 locomotives, 2 passenger cars, 1 baggage and mail car, 30 freight cars, and 48 platform and box cars.

The Hawaiian Railway, on the Island of Hawaii, is 20 miles in length and runs between Mahukona and Niulii. Its equipment consists of 3 locomotives and 56 cars.

INTERISLAND STEAMSHIP LINES.

Interisland Steam Navigation Company.—This company has its office in Honolulu, and its vessels ply between the islands of this group.

The steamers in service are:

Name.	Tonnage.	Length.	Breadth.	Depth.
		Feet.	*Feet.*	*Feet.*
W. G. Hall	380	158	30.06	12.08
Mikahala	354	151	29.08	12.03
Iwalani	240	146	28	11.06
Waialeale	176	120	27	9.08
Keau-hou	193	121	28.02	9.06
James Makee	137	111	25.06	9.06
Pele	134	102	32.06	9.07
Kaala	91	94	21	8.33

Wilder's Steamship Company.—This company has its headquarters at Honolulu and owns seven steamboats, which ply between the various islands of the group.

The vessels owned by this corporation are as follows:

Name.	Tonnage.	Horse-power.	Length.	Breadth.	Depth.
			Feet.	*Feet.*	*Feet.*
Claudine	609.16	1,000	178.67	32	15
Kinau	773.07	700	196	31	15
Likelike	382.34	525	168	27	17
Hawaii	227.44	400	159	32	10
Kilauea Hou	153.85	200	119	24	10.01
Lehua	129.80	250	116	24	8.06
Mokolii	42.21	125	84	18	7

ELLIS MILLS,
Consul-General.

HONOLULU, *January 1, 1895.*

OCEAN LINES.

Consul-General Mills having omitted any particulars concerning the ocean lines calling at Honolulu, the following is compiled from the Hawaiian Annual, the report of the United States Commissioner of Navigation; the Oregonian, of Portland, Oreg.; the San Francisco Chronicle, and the report of Consul Myers, of Victoria, British Columbia, pp. 27–31 of this volume:

The Hawaiian Annual prints a list of ocean steamships scheduled to arrive at and depart from Honolulu during the year 1895, from which the following is compiled: San Francisco, 34 steamships from and 32 for; colonies, 23 steamships from and 23 for; Vancouver, 12 steamships from and 12 for; China and Japan, 11 steamships from and 11 for; total arrivals, 80; total departures, 78.

The steamships having Vancouver for their starting point, as given in the Hawaiian Annual, belong to the Canadian and Australasian line. Consul Myers, of Victoria, British Columbia, in his report, says:

> This line was opened in 1893, the first trip being made by the *Miawera*, since then disabled and returned to England for repairs. The vessels now in service are the *Warrimoo* and *Arawa*. They are of 5,000 tons register, thoroughly seaworthy, of good power, and well fitted for both passenger and freight business. The terminal points are: Vancouver to Honolulu, 2,410 miles; Vancouver to Sydney, 6,824 miles. The first-class fare from Vancouver to Honolulu is $75; to Suva or Sydney, $200. Through freight rates run from $5 to $24 per ton, according to classification. The steamers stop at Victoria, British Columbia, going and coming, landing at the outer wharf. They make stops of several hours at Honolulu and Suva.

The steamers *Belgic*, *Coptic*, and *Gaelic*, of the Occidental and Oriental Line (British) do an express, passenger, and mail service, alternating with the Pacific Mail Steamship Company's vessels, between San

Francisco and Yokohama and Hongkong, and were booked, according to the Hawaiian Annual, for nine outward and the same number of homeward calls at Honolulu for 1895.

The steamers *China*, *Peru*, *City of Peking*, and *City of Rio de Janeiro*, of the Pacific Mail Steamship Company's line (American), express and passenger mail service, San Francisco to Yokohama and Hongkong, and return, call at Honolulu occasionally, according to the report of the United States Commissioner of Navigation, but they were booked in the Hawaiian Annual for twelve outward and the same number of homeward calls at Honolulu for 1895. The tonnage of these steamships is given as follows: *City of Peking*, 5,000; *City of Rio de Janeiro*, 3,548; *Peru*, 3,528; *China*, 4,940. The *China* flies the British flag; the others fly the United States flag. The first two are iron, and the last two steel vessels.

The vessels of the Oceanic Steamship Company (American), express, passenger, and mail service, run from San Francisco to Honolulu three times a month, and to New Zealand and Australia once a month, according to the report of the Commissioner of Navigation.

OCEAN DISTANCES.

The Hawaiian Annual prints the following as the distances from Honolulu:

To—	Nautical miles.	To—	Nautical miles.	To—	Nautical miles.
San Francisco	2,100	Samoa	2,290	Hongkong	4,800
Portland	2,460	Fiji	2,700	Yokohama	3,440
Panama	4,620	Auckland	3,810	Victoria	2,360
Tahiti	2,380	Sydney	4,480	Ocean Island	1,250

APPENDIXES.

APPENDIX A.

OCEAN LINES FROM UNITED STATES PORTS.

[From the report of the U. S. Commissioner of Navigation for 1894.]

Following is a review of established means of steam communication by sea between the ports of the United States and foreign countries. By the phrase "established means of steam communication" the design has been to include, first, steamship lines owning certain steamships which ply at stated periods between the United States and other countries, and, second, lines of communication of reasonable regularity, usually a freight service, established by steamship companies, charterers, or agents, making use of such steamships as are available for the particular service required. These vessels will change from time to time, the same steamship possibly making only one, two, or three trips on one "line" and then being employed by others. In such cases the effort has been made to give a reasonably exact view of the extent of the "line," nature of its service, and class of vessels employed, enumerating only enough vessels to convey this information, without giving all the steamers employed during the year. Such a statement can not be made with the certitude of official figures, but must observe a sense of proportion. The figures as to regular lines are approximately complete. The figures as to the second class of lines are full, but known to be incomplete. Beyond these two classes, steam communication between the United States and foreign countries is carried on by occasional steamships, chartered for single voyages as the conditions of trade and supply of freight may demand. For obvious reasons, no effort to cover this field has been made, such trade lacking the regularity of service on which, as far as possible, the following review is based.

The Bureau expresses its appreciation of the prompt, courteous, and full replies made to nearly every request, by the officers, agents, and managers of steamship lines, for the information on which, in the main, the tabulations are based.

Collectors of customs at all seaports were requested to address and forward to the president, secretary, or principal agent, resident at that port, of lines of steamships plying between that port and foreign countries copies of the following circular:

TREASURY DEPARTMENT, BUREAU OF NAVIGATION,
Washington, D. C., ——— —, ——.

SIR: The Bureau of Navigation, Treasury Department, wishes to ascertain as fully as practicable and report the present means of communication by established

lines of steamships between the ports of the United States and those of foreign countries. To this end you are respectfully requested to furnish information upon the following matters relating to your line:

First. List of the steamships of the line plying regularly between American and foreign ports, with the nationality, gross tonnage, average number of crew, and approximate value of each steamship.

Second. Schedule indicating ports of regular clearance and entry of the line, with frequency of sailings and usual period of voyage.

Third Capital stock of the company. Is any American capital invested in the line?

Fourth. A copy of any printed pamphlet or circular, prepared for distribution, giving information as to the line.

Fifth. Such further information as can be furnished, consistently with private interests, bearing upon the inquiry.

Where information desired was not supplied directly, collectors of customs, daily and weekly sailing lists, Lloyd's Register, the Répertoire Générale of the Bureau Veritas, and the tonnage tax reports to this Bureau were consulted to make the review as complete as possible. No replies were received from Galveston and Mobile, which are accordingly omitted. The tonnage reports for the year from Galveston show that about 25 chartered steamships, chiefly British, in steady employment were needed to carry its trade to foreign ports, and that Mobile's trade, chiefly in fruit from the West Indies and Central America, required the steady service of 10 chartered steamships, mainly Norwegian. The direct replies from New Orleans were incomplete, but the facts have been in the main supplied from other sources named. Wilmington, Del., Newport News, Norfolk, Charleston, and Savannah have also a carrying trade direct with foreign ports by occasional chartered vessels, but its irregularity impedes a statement of it in lines of established steam communication.

The statements embrace 648 steamships, of a tonnage in round numbers of 2,000,000 gross tons and of a value in round numbers of $155,000,000, manned by 42,000 men. To determine the tonnage, capital, and men to meet the continuing requirements the year round of our over-sea steam navigation, additions must be made for the service afforded by steamships chartered for occasional voyages at irregular periods not included in these figures, and for omissions. An addition to the figures above of 300,000 tons, valued at $15,000,000 and manned by about 6,000 men, would be a reasonably accurate statement of the steam tonnage in continuous employment required for our foreign trade.

Of these 648 steamships, 88 bear the American flag, and of these, 19 are foreign-built vessels admitted to American registry. A few are wooden vessels. Americans own a steam tonnage in foreign trade under foreign flags considerably greater than tonnage of a corresponding value under our own flag. The tables show 64 steamships under the British, Belgian, and Hawaiian flags, a majority interest in which is held by American capital. An inquiry into the facts of ownership borders so closely upon the line of governmental interference with pri-

vate business that this Bureau has made no effort to push that inquiry, but has merely invited information on the subject, which in some instances has been freely tendered, as the tables indicate. The replies do not, however, cover the entire field, and doubtless other steamships in the lists besides those indicated by italics are owned and controlled by American capital. This is indisputably the case in the West Indian fruit trade and the petroleum export trade, both of which are inadequately covered by the following tables. Information as to ownership under foreign flags, which is of prime consequence to legislative solution of our shipping problems, doubtless would have been more freely furnished had there been no apprehension on the part of Americans engaged in the foreign steam trade, under the only conditions in which it appears to be possible, that their investments might subject them to newspaper criticism.

So long as the laws forbid Americans to put under the flag and laws of their own country their own shipping purchased abroad, this Bureau has not deemed it feasible to put to shipowners the purely hypothetical question whether, if the laws were changed, they would avail themselves of their own flag and their own laws.

It is assumed that Americans prefer their own flag and the protection of their own Government, and that when they are unable to show that preference the laws require amendment. Attention is particularly directed to the fact that the purchase of steamships abroad by Americans has developed rapidly during the last five years, as indicated by the recent year of build of the vessels so owned.

The tables return 360 vessels under the British flag and 13 under the Belgian flag; but, as already indicated, the distinction of flag is misleading, American citizens owning nearly all the steamships under the Belgian flag and a considerable percentage of those under the British flag. Seventy-five German vessels, 33 Norwegian, 29 French, and 20 Dutch vessels are returned, and the remainder under various flags.

The summaries observe the following order: First, concise statement of the flag, capital stock, when given, American investment, general nature of service, and period of voyage of the several lines, arranged under each port geographically, beginning with lines to Great Britain, with which the bulk of our transatlantic trade is conducted; then Germany, France, and other European countries, Asia, Africa, and South America. Trade to Central American, West Indian, Gulf, and Caribbean foreign ports, and to the British colonies of North America, which is essentially a coasting trade as a matter of navigation, though classed as foreign on account of political divisions, is placed last. The numeral before each line is for ready reference to the corresponding numeral in the table of steamships with which each line conducts its trade from the same port.

The table of steamships gives, first, the name of each vessel. Names italicized indicate that a controlling interest in the vessel is American.

The letter (*a*) indicates a foreign-built vessel admitted to American registry; the letter (*b*) a vessel built in the United States. The flag under which the steamship sails, its gross tonnage, material of construction, and year of build follow. An approximate statement of the number of crew and value of each vessel has been furnished in many instances. Where not furnished, the Bureau, on the basis of information furnished by other lines, the description of the vessel, year, and material of construction, etc., gives in brackets an approximation of the total number of crew and value of fleet of each line. The purpose of this line of inquiry has been, not to ascertain the precise value of each vessel and the size of its crew, but to get some measure of the field for capital and labor which established lines of steam communication to foreign ports already afford. The estimates are to be taken with that qualification. It is noted, too, that the valuations owners put on their vessels differ widely, some placing high, some low values upon them. Such variations in the aggregate doubtless offset one another.

A table of registered steam vessels of the United States, not included in the tabulation, is printed at the end of this Appendix, so that the view of American steam vessels registered for foreign trade shall be complete.

NEW YORK TO GREAT BRITAIN.

1. *International Navigation Company* (American, British, Belgian flags).—Capital stock, ———, of which the controlling interest is American. Express, passenger, and mail service weekly to Southampton. Average period of voyage, under 7 days. (*See also* Philadelphia.)

2. *Cunard Line* (British).—Capital stock, in round numbers, $10,000,000. Express, passenger, and mail service weekly to Queenstown and Liverpool. Average period of voyage, under 7 days. (*See also* Boston.)

3. *White Star Line* (British).—Express service weekly to Queenstown and Liverpool. Average period of voyage, under 7 days. Also freight line.

4. *Anchor Line* (British)—Express, passenger, and mail service weekly to Moville and Glasgow.

5. *Guion Line* (British).—Biweekly express, passenger, and mail service to Queenstown and Liverpool. (This line was given up during the year.)

6. *National Line* (British).—Capital stock, $1,000,000. Weekly freight and live-stock service to London, the passenger service having been abandoned. Average period of trip, 12 to 14 days. (This line is the pioneer line in carrying across the Atlantic meat in refrigerators and live stock; the *Greece*, in March, 1876, having taken out the first raw meat, and the same ship in 1877 the first live cattle.)

7. *Arrow Line* (British).—Capital stock, $130,000, of which about $6,000 is American capital. Service, principally freight. Average period of voyage to Leith and Dundee, 10 days.

8. Manhanset Line (British flag).—Capital stock, $962,500; all American capital with the exception of one small interest. (*See also* Baltimore.) Service every 10 days to Bristol and Swansea, Wales.

9. Bristol City Line (British).—Semiweekly freight service to Bristol and Swansea and ports in the British Channel.

10. Wilson Hill Line (British).—Service, chiefly freight, to London about every week, according to conditions of trade. Average period of voyage, 14 days.

11. Wilson Line (British).—Weekly service to Hull and fortnightly service to Newcastle, chiefly freight. Average period of voyage to Hull, 14 days; Newcastle, 16 days.

12. Allan-State Line (British).—Weekly service to Glasgow. (*See also* Philadelphia, Boston, Portland.)

13. Atlantic Transport Line (British flag).—Capital, $3,000,000, almost exclusively American. Weekly passenger service to London. Average period of voyage, under 11 days. (*See also* Baltimore and Philadelphia.

14. Sumner Line (American).—Irregular freight and cattle service to Liverpool by chartered steamships of various flags.

15. Lamport & Holt Line (British).—Freight service at varying periods to Liverpool. (*See also* New Orleans.)

16. Knott's Prince Line (British).—Freight service to British ports at irregular periods. Also to South American and West Indian ports by steamships changed and dispatched according to the requirements of trade on the various lines of service.

NEW YORK TO GERMANY.

17. North German Lloyd (German).—Express, mail, and passenger service to Bremen, touching at Southampton, twice a week. Average period of voyage, 8½ days. Freight service twice a month; average time, 14 days.

18. Hamburg-American (German).—Weekly express, mail, and passenger service to Hamburg, via Southampton. Average period of voyage, 7½ days. Weekly mail and passenger service to Hamburg; return via Havre; average period of voyage, 10 to 11 days. Semimonthly freight service to Hamburg direct; average period of voyage, 13 to 14 days. (*See also* Boston, Baltimore, Philadelphia, New Orleans.)

19. Union Line (German).—Fortnightly passenger and freight service to Hamburg. Round trip, 6 weeks.

NEW YORK TO FRANCE.

20. Compagnie Générale Transatlantique (French).—Capital stock, in round numbers, $8,000,000. Express, passenger, and mail service, weekly, via Southampton to Havre. Average period of voyage, under 9 days.

21. Compagnie Nationale de Navigation de Marseille (French).—Capital stock, $1,500,000. Passenger and freight service to Marseilles and

Naples, sailings depending upon traffic. Average period of voyage, 18 days.

22. Nouvelle Compagnie Bordelaise de Navigation (French).—Capital stock, $150,000; partly American. Monthly freight service to Bordeaux.

23. Cyprien Fabre Line (French).—Fortnightly service to Marseilles (under 17 days) and Naples (under 18 days).

NEW YORK TO THE NETHERLANDS.

24. Netherlands-American Line (Dutch).—Capital stock, $1,680,000. Express, passenger, and mail service, semiweekly to Rotterdam and Amsterdam, calling at Boulogne. Average period of voyage, from 9 to 14 days.

25. North American Transport Line (British flag, American charterers).—Freight service to Rotterdam every 10 days. Average period of voyage, 15 days.

NEW YORK TO BELGIUM.

1. International Navigation Company (American).—Red Star Line (under Belgian flag). Semiweekly passenger and mail service to Antwerp.

[*11.*] *Wilson Line* (British).—Fortnightly service, chiefly freight, to Antwerp.

NEW YORK TO THE BALTIC.

[*18.*] *Hamburg-American* (German).—Scandia Line. Fortnightly to Christiansand, Gothenburg, Copenhagen, and Stettin. Average period of voyage, 15 days.

26. Thingvalla Line (Danish).—Capital stock, $536,000. Service every 10 days to Christiansand, Christiania, Copenhagen, and Stettin.

NEW YORK TO PORTUGAL AND SPAIN.

27. Linha de Vapores Portuguezes (Portuguese).—Passenger and freight service to the Azores, Oporto, Lisbon, and Cadiz. Round trip, 6 to 8 weeks.

28. Empresa Insulano (Portuguese).—Passenger and freight service to the Azores, Cape Verde and Canary islands, and Lisbon every 6 weeks. Usual period of voyage to Lisbon, 15 days.

NEW YORK TO THE MEDITERRANEAN.

[*4.*] *Anchor Line.*—To Gibraltar, Naples, Genoa, Leghorn, Messina, and Palermo. The service is not regular, but about once a fortnight. Steamers in this service load, according to freight offering, for Glasgow, Liverpool, or Mediterranean ports.

[*17.*] *North-German Lloyd.*—To Naples twice a month. Average period of voyage, 11 days, in conjunction with Hamburg-American Line. To Genoa twice a month; average period of voyage, 15 days.

[*18.*] *Hamburg-American.*—To Naples twice a month. Average period of voyage, 11 days, in conjunction with the North-German Lloyd Line.

29. Navigazione Generale Italiana (Italian).—Capital stock, $10,600,000. Passenger and freight service fortnightly to Gibraltar (15 days) and to Genoa (19 days.)

30. New York and Mediterranean Steamship Company.—"Phelps Line" (British flag). American capital. Freight service to Mediterranean ports.

NEW YORK TO CHINA AND JAPAN.

31. Barber & Co. (charterers).—Freight service about once in six weeks by varying chartered vessels to Singapore, Hongkong, Shanghai, Hiogo, and Yokohama, via Suez, calling at Hodeida and Aden.

32. Perry & Co. (charterers).—Same as above.

NEW YORK TO AFRICA.

33. Union Clan Line and American and African Line (British).—Alternate monthly freight service to South and East African ports by varying chartered vessels.

NEW YORK TO THE RED SEA AND EAST INDIAN PORTS.

34. Daniel Bacon (charterer).—Bimonthly freight service to Jeddah, Hodeida, Aden, and Bombay by varying chartered steamers.

NEW YORK TO SOUTH AMERICA.

35. Red D Line (American).—Mail, express, and passenger service every 10 days to Curacao, Puerto Cabello, La Guayra. Average round trip, 23 days. Also freight line to Maracaibo (1 steamer); round trip, 30 days. Also 1 steamer connecting Curacao and Maracaibo, and 1 steamer connecting Curacao and Le Vela de Coro.

36. Robert M. Sloman's Line (German).—Freight service monthly to Rio de Janeiro, Pernambuco, and Santos. Average round trip, 90 days. (*See also* Baltimore.)

37. Booth Steamship Line (British).—Monthly freight service to Para and Manaos; return via Barbados. Average round trip, 7 weeks. Also monthly freight service to Para, Maranhan, and Cera or Pernambuco, thence to London, and return via same ports to New York.

38. Red Cross Line (British).—Freight and mail service to various ports in Brazil.

39. Demerara Line (Norwegian flag, L. W. & P. Armstrong, charterers).—Freight service once a month to Demerara, British Guiana.

[*15.*] *Lamport & Holt Line* (British).—Freight and passenger service every 10 days to Pernambuco, Rio de Janeiro, and Bahia. Also Montevideo, Buenos Ayres, and Rosario at irregular intervals. The company owns 70 steamers, which are interchanged from one service to another according to the requirements of trade.

Knott's Prince Line. (See above.)

40. Norton Line (British).—Freight service semimonthly to Montevideo, Buenos Ayres, and Rosario; return via Rio de Janeiro.

41. W. R. Grace & Co., Merchants' Line (British flag).—American capital, $650,000. Monthly freight service to ports on west coast of South America.

NEW YORK TO CENTRAL AMERICA.

42. Pacific Mail Steamship Company (American).—Capital stock, $20,000,000. Express, passenger, and mail service weekly to Colon. Average period of voyage, 7 days. (*See also* San Francisco.)

43. Columbian Line (American; Panama Railroad Company, charterers).—New York to Colon every 10 days. Average period of voyage, 7 days. (*See also* San Francisco.)

44. Central American Steamship Line (James Rankine, charterer).—Fortnightly passenger and freight service to Jamaica, Belize, Greytown, and ports in Honduras and Nicaragua.

45. Merchants' Regular Line (R. Williams, jr.).—Service to Jamaica, Colon, Greytown, Bluefields, and ports of Nicaragua.

46. Nicaragua Line (Hurlbut & Co., charterers).—Fortnightly service to Bluefields and Bocas del Toro.

47. H. Dumois & Co. (charterers).—Freight service, chiefly banana trade, to Baracoa and Gibara by chartered steamers, varying according to season and trade from weekly to bimonthly. (*See also* Boston and Philadelphia.)

NEW YORK TO WEST INDIES AND MEXICO.

48. New York and Cuba Mail Steamship Company (American).—Capital stock, $2,500,000; all but $300,000 American. Express, passenger, and mail service to Havana, Matanzas, and Central American ports. Also fortnightly to Nassau, St. Jago, and Cienfuegos.

49. Koninklijke West-Indische Maildienst (Dutch).—Every three weeks to Haiti, Curaçao, Porto Cabello, La Guayra, Trinidad, Demerara, Paramaribo, and other West Indian and South American ports to Amsterdam.

50. Campañía Transatlántica Española (Spanish).—Passenger and mail service three times a month to Havana, Mexico, United States of Colombia, and Venezuela.

51. Atlas Line (British).—Passenger and mail service to Haiti and ports of United States of Colombia fortnightly; to South Haiti and Port Limon fortnightly; to Kingston, Jacmel, and Aux Cayes fortnightly. Also special winter passenger service to the West Indies.

52. Clyde's Dominican Line (American).—Fortnightly service to ports of Santo Domingo.

53. Clyde's Haitien Line (American).—Monthly service to ports of Haiti.

54. New York, Bermuda, and West India Line (British).—Fortnightly passenger and mail service to Bermuda. Average period of voyage, under 3 days.

55. Bahama Steamship Company (British).—Capital stock, $80,000, of which Americans own one-fourth. Passenger and mail service monthly to the Bahamas.

56. Waydell & Co. (charterers).—Monthly service to Matanzas and north Cuban ports. Round trip, 16 to 20 days. Also monthly to St. Iago de Cuba and Cienfuegos. Round trip, 28 to 30 days.

57. New York and Porto Rico Line (charterers).—Fortnightly freight service to Porto Rico. Round trip, 4 weeks.

58. Trinidad Line (Christall & Co., charterers).—Freight service to Granada, Trinidad, and Demerara. Usually weekly by chartered vessels.

59. Quebec Steamship Line (British).—To St. Thomas, St. Croix, Guadeloupe, Martinique, St. Lucia, and Barbados.

Knott's Line. (*See* above.)

60. Munson Line (charterers).—Irregular freight service to Cuban ports, usually every 10 days by changing chartered vessels. Average period of round trip, 30 days. (*See also* Philadelphia and Norfolk.)

NEW YORK TO BRITISH PROVINCES.

61. Red Cross Line (British).—Capital stock, $375,000, partly American. Passenger and freight service every 10 days to Halifax, Nova Scotia, and St. Johns, Newfoundland. Average period of round trip, 18 days.

1. INTERNATIONAL NAVIGATION COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
AMERICAN LINE.						
Paris (a)	American	10,508	Steel	1889	.....	.....
New York (a)	do	10,508	do	1888	.....	.....
Conemaugh (a)	do	2,328	Iron	1882	.....	.....
Berlin	British	5,526	do	1874	.....	.....
Chester	do	4,470	do	1873	.....	.....
ANTWERP, RED STAR LINE.						
Friesland	Belgian	7,116	Steel	1889	.....	.....
Westernland	do	5,736	do	1883	.....	.....
Noordland	do	5,212	do	1883	.....	.....
Rhynland	do	3,689	Iron	1879	.....	.....
Belgenland	do	3,692	do	1878	.....	.....
Nederland	do	2,839	do	1873	.....	.....
Waesland	do	4,752	do	1882	.....	.....
		66,376	.....	.....	[2,500]	[$6,000,000]

2. THE CUNARD STEAMSHIP COMPANY.

Campania	British	12,950	Steel	1893	.....	$3,000,000
Lucania	do	12,950	do	1893	.....	3,000,000
Etruria	do	8,120	do	1884	.....	1,000,000
Umbria	do	8,128	do	1884	.....	1,000 000
Aurania	do	7,269	do	1883	.....	800,000
Servia	do	7,392	do	1881	.....	700,000
		56,809	.....	.....	[2,300]	9,500,000

3. WHITE STAR LINE.

[(*a*) Foreign-built vessel, admittted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material	Year built.	No. crew.	Value.
EXPRESS.						
Majestic	British	9,933	Steel	1889		
Teutonic	do	9,952	do	1889		
Germanic	do	5,008	Iron	1874		
Britannic	do	5,004	do	1874		
Adriatic	do	3,887	do	1871		
FREIGHT.						
Cevic	British	8,301	Steel	1893		
Bovic	do	6,583	do	1892		
Nomadic	do	5,749	do	1891		
Tauric	do	5,727	do	1891		
Cufic	do	4,639	do	1888		
Runic	do	4,649	do	1889		
		69,432			[1,800]	[$8,000,000]

4. ANCHOR LINE.

Anchoria	British	4,168	Iron	1874		
Circassia	do	4,272	do	1878		
City of Rome	do	8,415	do	1881		
Devonia	do	4,270	do	1877		
Ethiopia	do	4,004	do	1873		
Furnessia	do	5,485	do	1880		
MEDITERRANEAN.						
Alsatia	British	2,799	Iron	1876		
Belgravia	do	5,000	do	1881		
Bolivia	do	4,050	do	1873		
Britannia	do	3,069	do	1879		
California	do	3,410	do	1872		
Elysia	do	2,733	do	1873		
Hesperia	do	3,027	do	1882		
India	do	2,476	do	1868		
Italia	do	2,245	do	1872		
Olympia	do	2,051	do	1871		
Scotia	do	3,287	do	1889		
Victoria	do	3,242	do	1872		
		68,003			[2,500]	[$3,000,000]

5. GUION STEAMSHIP COMPANY.

Alaska	British	6,900	Iron	1881		
Arizona	do	6,000	do	1879		
		12,900			[400]	[$600,000]

6. NATIONAL LINE.

America	British	5,157	Steel	1891		
Europe	do	5,302	do	1891		
Spain	do	4,512	Iron	1871		
England	do	4,897	do	1865		
France	do	4,281	do	1867		* $3,500,000
Greece	do	4,309	do	1863		
Denmark	do	3,723	do	1865		
The Queen	do	4,457	do	1865		
		36,638			[390]	

* Cost price.

7. ARROW LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Croma	British	3,187	Iron	1883		$150,000
Croft	do	2,675	Steel	1891		130,000
Critic	do	2,601	Iron	1881		85,000
Principia	do	2,749	do	1881		60,000
		11,212			[150]	425,000

8. MANHANSET LINE.

Manhanset	British	2,684	Steel	1891		$160,000
Mohican	do	2,728	do	1892		160,000
Monomoy	do	2,783	do	1892		160,000
Massassoit	do	2,783	do	1892		160,000
		10,978			[150]	640,000

9. BRISTOL CITY LINE.

Boston City	British	2,334	Iron	1882		
Chicago City	do	2,324	Steel	1892		
Wells City	do	1,814	do	1890		
Jersey City	do	1,936	Iron	1882		
Kansas City	do	3,679	Steel	1889		
Exeter City	do	2,198	do	1887		
Llandaff City	do	1,936	Iron	1882		
Brooklyn City	do	1,726	do	1881		
		17,947			[200]	[$750,000]

10. WILSON-HILL LINE.

Lydian Monarch	British	3,987	Steel	1881		$243,125
Alecto	do	3,607	do	1893		243,125
Ludgate Hill	do	4,063	do	1881		291,750
Richmond Hill	do	4,126	do	1882		291,750
		15,783			[165]	$1,069,750

11. WILSON LINE.

Francisco	British	4,604	Steel	1891		$291,750
Martello	do	3,709	Iron	1884		243,125
Colorado	do	4,220	Steel	1887		243,125
Galileo	do	3,060	Iron	1881		170,188
Buffalo	do	4,431	Steel	1885		291,750
Hindoo	do	3,592	do	1889		243,125
ANTWERP.						
Sorrento	British	2,208	Iron	1878		97,250
Othello	do	2,479	do	1872		97,250
Lepanto	do	2,287	do	1877		97,250
NEWCASTLE.						
Chicago	British	2,729	Iron	1884		97,250
Marengo	do	2,273	do	1879		97,250
Salerno	do	2,062	do	1879		97,250
		37,654			[500]	$2,036,563

12. ALLAN LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
State of California	British	5,500	Steel	1891	.....	.....
Norwegian	....do	3,523	Iron	1865	.....	.....
State of Nebraska	....do	4,000	....do	1881	.....	.....
Grecian	....do	3,613	....do	1879	.....	.....
		16,636		.....	[280]	[$900,000]

13. ATLANTIC TRANSPORT LINE.

Manitoba	British	5,672	Steel	1892	.....	.....
Massachusetts	....do	5,673	....do	1892	.....	.....
Mohawk	....do	5,658	....do	1892	.....	.....
Mobile	....do	5,780	....do	1893	.....	.....
Montezuma	....do	5,504	....do	1891	.....	.....
Mariposa	....do	5,305	....do	1891	.....	.....
Mississippi	....do	3,732	....do	1890	.....	.....
		37,324	.....	.....	[700]	[$2,400,000]

14. SUMNER LINE.

Euskaro	Spanish	2,472	Iron	1886	.....	.....
St. Ronans	British	4,457	....do	1881	.....	.....
		6,929	.....	.....	[100]	[$275,000]

15. LAMPORT & HOLT LINE.

Hevelius	Belgian	2,611	Iron	1874	.....	.....
Bellucia	British	2,715	Steel	1888	.....	.....
Galileo	....do	3,060	Iron	1881	.....	.....
Lassell	....do	1,955	....do	1879	.....	.....
Queensland	....do	3,892	Steel	1890	.....	.....
Maskelyne	Belgian	2,605	Iron	1874	.....	.....
Rubens	British	2,077	Steel	1887	.....	.....
Hubert	....do	1,922	....do	1894	.....	.....
Euclid	....do	1,559	Iron	1877	.....	.....
Olbeis	Belgian	2,168	....do	1870	.....	.....
		24,564	.....	.....	[400]	[$1,250,000]

16. KNOTT'S PRINCE LINES.

Indian Prince	British	1,862	Iron	1886	.....	.....
Castilian Prince	....do	2,316	Steel	1893	.....	.....
Turkish Prince	....do	1,986	Iron	1879	.....	.....
Asiatic Prince	....do	2,183	Steel	1888	.....	.....
British Prince	....do	3,937	....do	1882	.....	.....
Lancastrian Prince	....do	1,746	Iron	1881	.....	.....
Oranje Prince	....do	1,868	Steel	1889	.....	.....
Tudor Prince	....do	1,460	Iron	1884	.....	.....
Grecian Prince	....do	2,204	Steel	1890	.....	.....
Arabian Prince	....do	2,265	....do	1889	.....	.....
Kaffir Prince	....do	2,228	....do	1891	.....	.....
		24,055	.....	.....	[400]	[$1,250,000]

17. NORTH GERMAN LLOYD.

[(*a*) Foreign built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Havel	German	6,963	Steel	1890	180	
Spree	do	6,693	do	1890	180	
Lahn	do	5,097	do	1887	180	
Saale	do	4,965	do	1886	180	
Trave	do	4,966	do	1886	180	
Aller	do	4,964	do	1885	180	
Elbe	do	4,510	Iron	1881	180	
Munchen	do	4,796	Steel	1889	60	
H. H. Meier	do	5,306	do	1892	60	
Roland	do	3,660	do	1893	60	
Wittekind	do	4,990	do	1889	60	
NAPLES.						
Ems	German	4,728	Iron	1884	180	
Fulda	do	4,814	do	1882	180	
Werra	do	4,815	do	1882	180	
Kaiser Wilhelm II	do	6,991	Steel	1889	180	
		90,067			2,460	[$8,000,000]

18. HAMBURG-AMERICAN LINE.

EXPRESS.						
Augusta Victoria	German	7,761	Steel	1889	300	
Columbia	do	7,363	do	1889	300	
Fuerst Bismarck	do	8,874	do	1890	300	
Normannia	do	8,250	do	1890	300	
SCANDIA LINE.						
Virginia	German	2,884	Steel	1891	75	
Venetia	do	2,891	do	1891	75	
Slavonia	do	2,274	Iron	1883	75	
Gothia	do	2,433	do	1884		
MEDITERRANEAN.						
Suevia	German	3,609	Iron	1874	75	
Wieland	do	3,504	do	1874	75	
Gellert	do	3,533	do	1874	75	
HAMBURG.						
Scandia	German	4,375	Iron	1889	75	
Bohemia	do	3,423	do	1881	75	
Russia	do	4,017	do	1889	75	
Moravia	do	3,739	do	1883	40	
Dania	do	4,379	Steel	1889	75	
Rhaetia	do	3,553	do	1883	40	
Rugia	do	3,467	Iron	1882	40	
California	do	2,690	do	1883	40	
Italia	do	3,498	Steel	1889	40	
Prussia	do	5,937	do	1894	75	
Persia	do	6,000	do	1894	75	
Grimm	do	2,599	do	1890	40	
		101,053			2,340	[$6,0000,00]

19. UNION LINE STEAMERS.

Amalfi	German	2,345	Iron	1881	40	$300,000
Marsala	do	2,397	do	1882	40	370,000
Taormina	do	2,422	do	1884	40	465,000
Sorrento	do	2,362	do	1881	40	325,000
		9,526			160	1,460,000

20. COMPAGNIE GÉNÉRALE TRANSATLANTIQUE.

[(*a*) Foreign-built vessels admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Materlal.	Year built.	No. crew.	Value.
La Touraine	French	8,863	Steel	1890	.....	.....
La Champagne	....do	7,087	....do	1885	.....	.....
La Bourgogne	....do	7,305	....do	1885	.....	.....
La Bretagne	....do	7,112	....do	1886	.....	.....
La Normandie	....do	6,283	Iron	1882	.....	.....
La Navarre	....do	6,959	Steel	1892	.....	.....
		43,609	.....	.....	[1,600]	[$7,000,000]

21. COMPAGNIE NATIONALF DE NAVIGATION DE MARSEILLES.

Cachar	French	3,645	Iron and steel.	1884	50	$200,000
Cachemire	....do	3,360	....do	1884	50	200,000
Canton	....do	3,721	Iron	1882	50	200,000
Chandernagor	....do	3,075	....do	1882	45	175,000
Cheribon	....do	3,075	....do	1882	50	175,000
Colombo	....do	3,733	....do	1882	50	200,000
Comorin	....do	3,742	....do	1882	50	200,000
Hindoustan	....do	2,953	....do	1881	40	150,000
		27,304	.....	.....	385	1,500,000

22. NOUVELLE COMPAGNIE BORDELAISE.

Chateau Lafite	French	3,462	Iron	1881	45	$150,000
Panama	....do	2,118	....do	1881	30	100,000
		5,580	.....	.....	75	250,000

23. CYPRIEN FABRE LINE.

Alesia	French	2,851	Iron	1882	43	About $150,000 each.
Burgundia	....do	2,169	....do	1882	43	
Britannia	....do	2,527	....do	1881	42	
Gergovia	....do	2,144	....do	1883	36	
Massilia	....do	3,327	.....	.....	43	
Neustria	....do	2,959	Iron	1883	43	
		15,977	.....	.....	250	900,000

24. NETHERLANDS-AMERICAN LINE.

Spaarndam	Dutch	4,600	Steel	1881	120	.....
Maasdam	....do	4,000	Iron	1871	120	.....
Veendam	....do	4,000	....do	1871	120	.....
Obdam	....do	3,700	Steel	1880	100	.....
Werkendam	....do	3,700	....do	1881	100	.....
Amsterdam	....do	3,650	Iron	1879	100	.....
Rotterdam	....do	3,500	....do	1878	100	.....
Didam	....do	2,800	Steel	1891	70	.....
Dubbeldam	....do	2,800	....do	1891	70	.....
Edam	....do	3,200	....do	1883	50	.....
Zaandam	....do	3,100	Iron	1882	50	.....
Schiedam	....do	2,800	....do	1874	50	.....
P. Caland	....do	2,600	....do	1874	50	.....
		44,450	.....	.....	1,100	[$2,500,000]

25. NORTH AMERICAN TRANSPORT LINE.

[(*a*) Foreign-built vessel admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Loch Lomond	British	2,571	Steel	1888		$125,000
Loch Maree	do	2,698	do	1890		125,000
Loch Etive	do	2,138	do	1886		100,000
Carlisle	do	2,141	Iron	1882		75,000
Winchester	do	2,198	do	1882		75,000
		11,746			[175]	500,000

26. THINGVALLA.

Amerika	Danish	3,867	Iron	1872	105	$194,500
Thingvalla	do	2,524	do	1874	44	97,250
Island	do	2,844	do	1882	58	97,250
Norge	do	3,359	do	1881	60	97,250
Hekla	do	3,258	do	1884	68	97,250
		15,852			335	583,500

27. LINHA DE VAPORES PORTUGUEZES.

Donna Maria	Portuguese	2,539	Steel	1887	61	$125,000
Olinda	do	1,479	do	1887	31	100,000
Oevenum	do	2,298	Iron	1888	31	125,000
		6,316			122	350,000

28. EMPRESA INSULANO.

Peninsular	Portuguese	2,744	Steel	1887	67	$200,000
Vega	do	2,893	Iron	1879	67	200,000
		5,637			134	400,000

29. NAVIGAZIONE GENERALE ITALIANA.

Entella	Italian	2,258	Iron	1883	55	.....
Letimbro	do	2,172	do	1883	55	.....
Plata	do	1,861	do	1878	50	.....
Iniziativa	do	2,040	do	1881	55	.....
San Giorgio	do	2,817	do	1886	60	.....
Montebello	do	2,577	Steel	1887	60	.....
		13,725			335	[$800,000]

30. NEW YORK AND MEDITERRANEAN LINE.

Pawnee	British	1,798	Iron	1881	.....	.....
Peconic	do	1,795	do	1881	.....	.....
Picqua	do	1,796	do	1882	.....	.....
Pocahontas	do	2,627	Steel	1889	.....	.....
Pocasset	do	2,627	do	1889	.....	.....
Pontiac	do	1,698	Iron	1879	.....	.....
Powhatan	do	2,536	Steel	1886	.....	.....
		14,877			[250]	[$750,000]

31. BARBER & CO. (AGENTS).

Gulf of Genoa	British	3,448	Steel	1891	.....	.....
Oscar II	Norwegian	3,057	do	1893	.....	.....
Maple Branch	British	2,637	do	1888	.....	.....
Oakley	do	2,674	do	1892	.....	.....
Strathdon	do	2,643	do	1890	.....	.....
		14,459			[200]	[$700,000]

32. EDWARD PERRY & CO.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Cardiganshire	British	2,486	Iron	1883	.....	.....
Flintshire	....do	2,879	Steel	1888	.....	.....
		5,365	.....	.....	[75]	[$250,000]

33. UNION CLAN AND AMERICAN AND AFRICAN LINES.

Olive Branch	British	2,732	Steel	1887	.....	.....
Drummond	....do	2,832	....do	1890	.....	.....
Craigearn	....do	3,013	....do	1894	.....	.....
		8,577	.....	.....	[125]	[$500,000]

34. DANIEL BACON (CHARTERER).

Loango	British	2,935	Steel	1883	.....	.....
Glenloig	....do	3,100	....do	1892	.....	.....
St. Regulus	....do	3,086	....do	1886	.....	.....
York	....do	3,290	Iron	1883	.....	.....
Ethelgonda	....do	2,692	Steel	1891	.....	.....
		15,103	.....	.....	[275]	[$750,000]

35. RED D LINE OF STEAMERS.

Venezuela (*b*)	American	2,843	Iron	1889	60	$300,000
Caracas (*b*)	....do	2,584	....do	1889	60	300,000
Philadelphia (*b*)	....do	2,520	....do	1885	56	250,000
Maracaibo (*b*)	....do	1,262	Wood	1889	31	150,000
Merida (*b*)	....do	517	....do	1880	27	60,000
Nansemond (*b*)	....do	310	....do	1887	15	40,000
Valencia (*b*)	....do	1,598	Iron	1882	40	150,000
		11,634	.....	.....	289	1,250,000

36. ROBERT M. SLOMAN LINE.

Capua	German	2,012	Steel	1889	36	$470,000
Salerno	British	2,062	Iron	1879	36	470,000
Catania	German	2,198	....do	1881	38	330,000
		6,272	.....	.....	110	1,270,000

37. BOOTH STEAMSHIP COMPANY.

Basil	British	1,184	Iron	1871	32	.....
Clement	....do	1,227	....do	1877	32	.....
Cyril	....do	1,190	....do	1882	32	.....
Gregory	....do	1,497	....do	1879	32	.....
Hilary	....do	1,929	Steel	1889	35	.....
Hildebrand	....do	1,947	....do	1893	40	.....
Hubert	....do	1,921	....do	1894	40	.....
Justin	....do	1,744	Iron	1880	35	.....
Origen	....do	1,541	Steel	1886	35	.....
		14,180	.....	.....	313	$900,000

38. RED CROSS LINE.

Amazonense	British	1,692	Iron	1869	.....	.....
Cearense	....do	1,381	....do	1869	.....	.....
Maranhense	....do	1,480	....do	1880	.....	.....
Lisbonense	....do	1,594	....do	1871	.....	.....
Paraense	....do	1,697	....do	1871	.....	.....
Sobralense	....do	1,982	....do	1884	.....	.....
Mananense	....do	1,672	....do	1874	.....	.....
Theresina	....do	1,150	....do	1876	.....	.....
Obidense	....do	2,380	Steel	1891	.....	.....
		15,028	.....	.....	[300]	[$600,000]

39. DEMERARA LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built	No. crew.	Value.
Tjomo	Norwegian	1,444	Steel	1892	21	$100,000

40. NORTON LINE

Delcomyn	British	1,818	Iron	1880	28	$68,040
Manitoba	do	2 127	Steel	1887	31	85,050
Merida	do	2,280	do	1888	31	111,780
Etona	do	2,513	do	1890	35	121,500
Tagus	do	305	do	1872	18	43,740
		9,543			143	430,110

41. WM. R. GRACE & CO.

Coya	British	2,607	Steel	1886	36	$160,000
Condor	do	3,035	do	1893	36	160,000
Capac	do	3,052	do	1893	36	160,000
Cacique	do	3,050	do	1894	36	160,000
		11,744			144	640,000

42. PACIFIC MAIL STEAMSHIP COMPANY.

City of Para (*b*)	American	3,532	Iron	1878	77	$543,000
Columbia (*b*)	do	3,617	Steel	1892	78	600,000
Newport (*b*)	do	2,735	Iron	1880	76	350,000
		9,884			231	1,493,000

43. COLUMBIAN LINE.

Allianca (*b*)	American	2,985	Iron	1886		$225,000
Advance (*b*)	do	2,605	do	1883		200,000
Finance (*b*)	do	2,603	do	1883		200,000
		6,193			[125]	625,000

44. CENTRAL AMERICAN STEAMSHIP LINE (CHARTERERS).

Delta	British	831	Iron	1854		
Bermuda	do	1,284	do	1874		
Ozarina (*b*)	American	983	do	1883		
		3,098			[60]	[$125,000]

45. MERCHANTS' REGULAR LINE.

Flamborough	British	993	Iron	1867		
Premier	do	374	Steel	1891		
		1,367			[35]	[$60,000]

46. NICARAGUA LINE.

Tyr	Norwegian	2,253	Steel	1891		
George Sealy	do	844	do	1894		
John Wilson	do	808	do	1893		
		3,905			[70]	[$300,000]

47. H. DUMOIS & CO.

[(*a*) Foreign-built vessel, admitted to American registry; (*b* built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Tyrian	British	1,455	Steel	1890		
Claribel	do	1,134	Iron	1872		
Banes	Norwegian	748	Steel	1890		
Baracoa	do	784	do	1890		
Kitty	do	1,004	do	1891		
Leon	do	793	do	1890		
Moringen	do	567	do	1871		
		6,485			[150]	[$750,000]

48. NEW YORK AND CUBA MAIL STEAMSHIP COMPANY.

Niagara (*b*)	American	2,265	Iron	1877	65	$180,000
Saratoga (*b*)	do	2,820	do	1878	65	230,000
Santiago (*b*)	do	2,359	do	1879	65	250,000
Cienfuegos (*b*)	do	2,865	do	1883	65	280,000
City of Washington (*b*)	do	2,863	do	1877	65	330,000
Yumuri (*b*)	do	3,497	Steel	1890	65	420,000
Orizaba (*b*)	do	3,497	do	1890	65	420,000
Yucatan (*b*)	do	3,525	do	1890	65	420,000
Vigilançia (*b*)	do	4,115	do	1890	65	475,000
Segurança (*b*)	do	4,033	do	1890	65	475,000
Seneca (*b*)	do	2,729	Iron	1884	65	250,000
Manteo (*b*)	do	584	do	1887	65	75,000
		35,152			780	3,805,000

49. KONINKLIJKE WEST-INDISCHE MAILDIENST.

Orange-Nassau	Dutch	1,304	Iron	1883	50	
Prins Maurits	do	1,304	do	1884	50	
Prins Frederik Hendrik	do	1,642	do	1888	50	
Prins Willem I	do	1,950	Steel	1890	50	
Prins Willem II	do	1,950	do	1890	50	
Prins Willem III	do	1,950	do	1890	50	
		10,100			300	[$550,000]

50. CAMPANIA TRANSATLANTICA.

Habana	Spanish	2,678	Iron	1872	70	$300,000
Ciudad Condal	do	2,595	do	1872	70	300,000
Mexico	do	2,112	do	1876	70	300,000
Panama	do	2,085	do	1875	70	300,000
		9,470			280	1,200,000

51. ATLAS STEAMSHIP COMPANY.

Adirondack	British	2,167	Steel	1888	40	
Alene	do	2,239	Iron	1880	40	
Athos	do	1,944	do	1879	40	
Ailsa	do	1,957	do	1877	40	
Alvena	do	1,744	do	1870	40	
Andes	do	1,711	do	1865	35	
Alps	do	1,724	do	1865	35	
Adula	do	772	Steel and iron	1889	30	
		14,258			300	[$700,000]

52. DOMINICAN LINE.

Saginaw (*a*)	American	1,736	Iron	1883	40	$150,000
Geo. W. Clyde (*b*)	do	1,849	do	1872	40	150,000
		3,585			80	300,000

53. HAITIEN LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Ozama (*a*)	American	1,028	Iron	1881	38	$125,000

54. NEW YORK, BERMUDA AND WEST INDIA LINE.

Trinidad	British	2,592	Iron	1884	55	$300,000

55. BAHAMAS STEAMSHIP COMPANY.

Antilia	British	929	Steel	1893	20	$75,000

56. WAYDELL & CO. (CHARTERERS).

Bea Bellido	British	1,914	Steel	1893	25	$120,000
Ardangosses	....do	2,100	Iron	1881	23	60,000
Ardancorrah	....do	1,432	Steel	1882	22	50,000
		5,446			70	230,000

57. NEW YORK AND PUERTO RICO LINE (CHARTERED).

Rannoch	British	1,812	Steel	1889		
Fort William	....do	1,807	....do	1888		
		3,619			[65]	[$180,000]

58. TRINIDAD LINE (GEO. CHRISTALL).

Creole Prince	British	2,047	Steel	1893		
Carib Prince	....do	2,048	....do	1893		
rrawaddy	....do	2,622	Iron	1873		
		6,717			[110]	[$500,000]

59. QUEBEC STEAMSHIP COMPANY TO WEST INDIES.

Caribbee	British	1,944	Iron	1878		
Fontabelle	....do	2,646	....do	1882		
Muriel	....do	2,398	Steel	1889		
Madiana	....do	3,080	Iron	1876		
		10,068			[200]	[$500,000]

60. MUNSON LINE.

Ardandhu	British	2,091	Steel	1883		
Ardanmhor	....do	2,082	....do	1891		
Ardanrose	....do	2,019	....do	1894		
Kong Frode	Norwegian	954	....do	1888		
Banan	....do	978	....do	1888		
County Down	British	2,210	....do	1890		
Schleswig	German	1,458	Iron	1875		
Breidalbik	Norwegian	711	Steel	1890		
		12,503			[250]	[$650,000]

61. RED CROSS LINE.

Miranda	British	1,158	Iron	1884	33	$125,000
Portia	....do	1,156	....do	1884	33	125,000
Silvia	....do	1,704			33	125,000
		4,018			99	375,000

PHILADELPHIA TO GREAT BRITAIN.

1. *International Navigation Company* (American).—Passenger service (American line) once every three weeks to Liverpool; also freight service to Liverpool and British ports.

2. *Allan Line* (British).—To Glasgow, via Halifax, St. Johns, Newfoundland, and Liverpool, passenger, freight, and mail service.

3. *Johnson-Trident Line* (British).—Weekly freight service to London and Swansea.

4. *Atlantic Transport Line* (American).—Weekly freight service to London and Swansea in connection with the Johnson-Trident Line. (*See also* New York and Baltimore.)

PHILADELPHIA TO GERMANY.

5. *Hamburg-American* (German).—Weekly freight service from Hamburg and return, via Baltimore.

PHILADELPHIA TO BELGIUM.

[1] *International Navigation Company* (American line).—Weekly passenger and freight service to Antwerp.

PHILADELPHIA TO WEST INDIES, MEXICO, AND CENTRAL AMERICA.

6. *Earn Line* (American).—Irregular freight service (coal) to West Indian and Cuban ports and return (iron ore and sugar); sailings monthly. Average period of voyage, round trip, 4 to 5 weeks. Capital stock, $1,000,000; incorporated under the laws of New Jersey (vessels of this line also run occasionally from Baltimore).

Munson Line (charterers).—Irregular freight service biweekly to Mexican ports. (Also tank steamers to Cuba between March and July.)

8. *H. Dumois & Co.* (charterers).—Irregular freight service (fruit) to Central American ports.

In addition to the lines given above, Philadelphia is the center of a considerable petroleum export trade to French ports and to Antwerp under the French and Belgian flags, and a considerable fruit importation trade with Central American, Cuban, and West Indian ports by means of chartered vessels, chiefly under the Norwegian flag.

1. INTERNATIONAL NAVIGATION COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Ohio (*b*)	American	3,392	Iron	1873		
Indiana (*b*)	do	3,158	do	1873		
Illinois (*b*)	do	3,126	do	1873		
Pennsylvania (*b*)	do	3,166	do	1872		
Switzerland	Belgian	2,816	do	1874		
Pennland	do	3,760	do	1870		
Southwark	British	8,607	Steel	1893		
Kensington	do	9,000	do	1893		
British Princess	do	3,926	do	1882		
Lord Gough	do	3,655	Iron	1879		
		42,606			[1,000]	[$2,250,000]

2. ALLAN LINE.

Siberian	British	3,904	Steel	1884	70	
Carthaginian	do	4,214	do	1884	70	
Corean	do	3,488	Iron	1881	70	
		11,606			210	[$600,000]

3. JOHNSTON-TRIDENT LINE.

Enskar	British	3,093	Steel	1890	32	$150,000
Fonar	do	3,014	do	1889	32	150,000
Holkar	do	3,278	do	1891	32	150,000
		9,385			96	450,000

4. ATLANTIC TRANSPORT LINE.

Maine	British	2,780	Steel	1887	32	$150,000
Missouri	do	2,845	do	1889	32	150,000
		5,625			64	300,000

5. HAMBURG-AMERICAN.

Polynesia	German	2,196	Iron	1881		
Steinhoft	do	2,479	Steel	1889		
Stubbenhuk	do	2,943	do	1890		
Baumwell	do	2,889	do	1890		
		10,507			[150]	[$550,000]

6. EARN LINE.

Earnwell	British	2,013	Steel	1886	26	$100,000
Earnford	do	2,209	do	1889	26	125,000
Earndale	do	2,263	do	1889	26	135,000
Earnwood	do	2,101	do		26	85,000
Earncliffe	do	2,258	Iron	1881	26	90,000
		10,844			130	535,000

7. MUNSON LINE.

Centurion	British	1,942	Steel	1893		
Cuba	Norwegian	726	Iron	1883		
Moonstone	British	2,076	do	1889		
		4,744			[90]	[$225,000]

8. H. DUMOIS & CO. (CHARTERERS).

[(*a*) Foreign-built vessel admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Donau	Norwegian	1,452	Iron	1882		
Jamaica	do	721	Steel	1892		
Alert	do	783	Iron	1884		
Wellhaven	do	678	do	1884		
		3,634			[70]	[$175,000]

PETROLEUM VESSELS

Ville de Dieppe	French	1,228	Steel and iron	1888		
Mexicano	British	1,973	Steel	1893		
Ville de Douai	French	1,919	do	1890		
La Hesbaye	Dutch	2,539	do	1888		
Le Lion	French	2,407	do	1893		
		10,006			[150]	[$450,000]

BALTIMORE TO GREAT BRITAIN.

1. Atlantic Transport Line (American).—Capital stock, $3,000,000, nearly all American. Weekly sailings to London. Average passage, 14 days. (*See also* New York and Philadelphia.)

2. Manhanset Line (British; American owners).—Operated in connection with the North American Transport Line.

3. Lord Line (British).—To Belfast every 10 days. Average passage, 14 days.

4. Bristol Channel Line (British).—Monthly sailings to Leith and Bristol. Average passage, 14 days.

5. Johnston Line (British).—Freight service to Liverpool.

BALTIMORE TO GERMANY.

6. Hamburg-American Line (German).—Every 10 days to Hamburg. Average passage, 15 days. (*See also* New York, New Orleans, Philadelphia, and Boston.)

7. North German Lloyd (German).—Weekly sailings to Bremen. Average voyage, 12½ days. (*See also* New York.)

Earn Line.—(*See* Philadelphia.)

Red Cross Line.—(*See* New York for list of vessels.) Occasional freight service.

BALTIMORE TO HOLLAND.

8. Neptune Line (British).—Weekly freight service to Rotterdam. Round trip, 6 weeks. Capital stock, $1,680,000.

BALTIMORE TO WEST INDIES, MEXICO, AND CENTRAL AMERICA.

9. Buckman Fruit Company (charterers).—Biweekly sailings to Port Antonio, Jamaica.

1. ATLANTIC TRANSPORT LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Maryland	British	2,773	Steel	1886	40	
Montana	do	2,775	do	1887	40	
Michigan	do	3,722	do	1890	40	
Minnesota	do	3,216	do	1887	40	
		12,486			160	$800,000

2. MANHANSET LINE.

Massepequa	British	3.026	Steel	1893	30	$160,000
Menantic	do	3,024	do	1893	30	160,000
		6,050			60	320,000

3. LORD LINE.

Lord Londonderry	British	2,409	Steel	1888	33	
Lord Lansdowne	do	2,753	Iron	1884	33	
Lord O'Neill	do	2,751	do	1884	33	
Lord Bangor	do	2,991	Steel	1890	33	
Lord Charlemont	do	3,138	do	1886	33	
Bengore Head	do	2,490	Iron	1884	33	
		16,532			198	$1,000,000

4. BRISTOL CHANNEL LINE.

Govino	British	2,279	Iron	1882	28	
Prodano	do	2,476	Steel	1890	28	
Dago	do	1,914	Iron	1877	28	
Khio	do	2,376	Steel	1889	28	
		9,045			112	$400,000

5. JOHNSTON LINE TO LIVERPOOL.

Queensmore	British	3,792	Steel	1890		
Parkmore	do	3,318	do	1890		
Castlemore	do	2,868	do	1892		
Barrowmore	do	3,715	Iron	1884		
Baltimore	do	3,730	do	1884		
Rossmore	do	4,360	Steel	1889		
Sedgemore	do	4,332	do	1891		
		26,115			[350]	[$1,100,000]

6. HAMBURG-AMERICAN PACKET COMPANY.

Polynesia	German	2,196	Iron	1881	42	
California	do	2,690	do	1883	42	
Hungaria	do	2,036	Steel	1884	42	
Italia	do	3,498	do	1889	42	
Wandrahm	do	2,683	do	1891	42	
Remus	do	2,635	do	1889	42	
Barmen	do	2,614	do	1889	42	
		18,352			294	$1,300,000

7. NORTH GERMAN LLOYD.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
America	German	2,752	Iron	1863	100	$100,000
Dresden	do	4,802	Steel	1888	100	500,000
Stuttgardt	do	5,349	do	1889	100	500,000
Darmstadt	do	5,316	do	1890	100	500,000
Gera	do	5,319	do	1890	100	500,000
Weimar	do	5,318	do	1891	100	500,000
		28,856			600	2,600,000

8. NEPTUNE LINE.

Urbino	British	2,412	Iron	1881	27	$129,600
Ohio	do	2,389	Steel	1888	27	124,800
Patapsco	do	2,933	do	1890	28	153,600
Chicago	do	2,381	do	1890	27	139,200
Venango	do	2,938	do	1891	28	163,200
Delano	do	2,968	do	1892	28	163,200
		16,021			165	873,600

9. BUCKMAN FRUIT COMPANY (CHARTERERS).

America	Norwegian	900	Steel	1890	18	$75,000
Managua	do	730	do	1890	16	70,000
Culmore	do	650	do	1890	16	70,000
		2,280			50	215,000

BOSTON TO GREAT BRITAIN.

1. Cunard Line (British).—Semiweekly sailings to Queenstown and Liverpool. (*See also* New York.)

2. Allan Line (British).—To Glasgow, calling at Liverpool, Moville, Galway, and Halifax, fortnightly service. (*See also* Portland, Philadelphia, and New York.)

3. Leyland Line (British).—Freight service weekly to Liverpool. Average time of passage, 10 days.

4. Warren Line (British).—Freight service to Liverpool.

Wilson-Hill Line.—Fortnightly service calling at New York. (*See* New York.)

5. Furness Line (British).—Irregular freight service to Liverpool.

6. Johnston Line (British).—Irregular freight service to London.

BOSTON TO BELGIUM.

7. Hamburg-American Line (German).—(*See also* New York, Boston, Philadelphia, and New Orleans.)

8. Puritan Line (British).—Irregular freight service to Antwerp.

BOSTON TO THE BRITISH PROVINCES.

9. Yarmouth Steamship Line (British).—Semiweekly passenger and freight service to Yarmouth, Nova Scotia. Capital stock, $342,000, of which a considerable amount is American.

Plant Line.—(*See* Tampa, Fla.)

10. Société Saint-Pierraise de Navigation à Vapeur (French).—Capital stock, $82,000. Fortnightly service to Halifax and St. Pierre, Miquelon.

Fruit steamers.—There is a large import trade between Boston and West Indian and Central American ports by means of vessels, chiefly under the Norwegian flag, owned and chartered by various companies, the most prominent among which is the Boston Fruit Company.

1. CUNARD LINE.

[(*a*) Foreign-built vessels, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag	Gross tons.	Material.	Year built.	No. crew.	Value.
Catalonia	British	4,841	Iron	1881	.....	.....
Bothnia	....do	4,535	....do	1874	.....	.....
Pavonia	....do	5,588	....do	1882	.....	.....
Cephalonia	....do	5,517	....do	1882	.....	.....
Scythia	....do	4,557	....do	1875	.....	.....
		25,038	.....	.....	[700]	[$1,800,000]

2. ALLAN LINE.

Scandinavian	British	3,068	Iron	1870	70	.....
Nestrian	....do	2,689	....do	1866	70	.....
Prussian	....do	3,030	....do	1869	70	.....
		8,787	.....	.....	210	[$600,000]

3. LEYLAND LINE.

Georgian	British	5,100	Steel	1890	50	$300,000
Columbian	....do	5,100	....do	1890	50	300,000
Lancastrian	....do	5,100	....do	1891	50	300,000
Philadelphian	....do	5,100	....do	1891	50	300,000
Bostonian	....do	4,500	....do	1888	50	300,000
		24,900	.....	.....	250	1,500,000

4. WARREN LINE.

Michigan	British	4,917	Steel	1887	50	.....
Sagamore	....do	5,036	....do	1892	50	.....
Sachem	....do	5,204	....do	1893	50	.....
Norseman	....do	4,442	Iron	1882	50	.....
Roman	....do	4,559	....do	1884	50	.....
Cambroman	....do	4,920	Steel	1892	50	.....
Ottoman	....do	4,843	....do	1890	50	.....
Angloman	....do	4,892	....do	1892	50	.....
Kansas	....do	5,276	Iron	1882	50	.....
Palestine	....do	2,867	....do	1858	50	.....
		46,956	.....	.....	500	[$2,000,000]

5. FURNESS LINE.

Stockholm City	British	2,686	Iron	1884	.....	.....
Carlisle City	....do	3,002	Steel	1894	.....	.....
Durham City	....do	3,092	Iron	1882	.....	.....
		8,780	.....	.....	[150]	[$500,000]

6. JOHNSTON LINE.

[(*a*) Foreign built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
British Queen	British	4,388	Steel	1890	.....	.....
British Empire	....do	3,020	....do	1889	.....	.....
Nessmore	....do	3,377	Iron	1882	.....	.....
Oranmore	....do	3,377	....do	1882	.....	.....
Mentmore	....do	3,405	....do	1882	.....	.....
		17,568	.....	.....	[275]	[$700,000]

7. HAMBURG-AMERICAN LINE.

Steinhoft	German	2,479	Steel	1889	.....	.....
Cremon	....do	2,067	Iron	1871	.....	.....
Markomannia	....do	3,470	Steel	1890	.....	.....
Baumwell	....do	2,889	....do	1890	.....	.....
Hungaria	....do	2,036	....do	1884	.....	.....
		12,941	.....	.....	[175]	[$850,000]

8. PURITAN LINE.

Rialto	British	2,229	Iron	1878	.....	.....
Otranto	....do	2,379	....do	1877	.....	.....
		4,608	.....	.....	[80]	[$200,000]

9. YARMOUTH STEAMSHIP COMPANY.

Boston	British	1,694	Steel	1890	55	$220,000
Yarmouth	....do	1,452	....do	1887	50	140,000
		3,146	.....	.....	105	360,000

10. SOCIÉTÉ SAINT-PIERRAISL DE NAVIGATION À VAPEUR.

Pro Patria	French	339	.....	.....	22	$100,000

FRUIT LINES.

Barnstable	British	1,356	Steel	1894	.....	.....
Brookline	....do	1,352	....do	1894	.....	.....
Ethelred	....do	1,110	Iron	1872	.....	.....
Antonio Zambrano	Norwegian	505	Steel	1890	.....	.....
Bergenseren	....do	665	Iron	1884	.....	.....
Alfred Dumois	....do	728	Steel	1890	.....	.....
Brixham (*a*)	American	626	Iron	1885	.....	.....
San Domingo	British	1,087	....do	1874	.....	.....
Bratten	Norwegian	705	....do	1878	.....	.....
Usk	British	869	Steel	1891	.....	.....
Unitas	....do	598	Iron	1874	.....	.....
City of Kingston	....do	844	Steel	1893	.....	.....
Hiram	Norwegian	602	....do	1890	.....	.....
Vale	....do	745	Wood	1874	.....	.....
Ethelwold	British	956	Steel	1890	.....	.....
Bowden (*a*)	American	777	Iron	1886	.....	.....
Yulu (*b*)	....do	340	Wood	1891	.....	.....
Bernard (*a*)	....do	918	Iron	1870	.....	.....
		12,788	.....	.....	[250]	[$700,000]

PORTLAND TO GREAT BRITAIN.

1. Mississippi and Dominion Steamship Company (British).—Capital stock, in round numbers, $1,500,000, of which about $100,000 is American. From November to March fortnightly service to Liverpool and monthly service to Bristol. Round trip, 4 to 5 weeks.

2. Allan Line (British).—Fortnightly passenger service to Liverpool during winter months. (*See also* Philadelphia, Boston, New York.)

3. Donaldson Line (British).—Irregular service during winter months to Glasgow.

1. MISSISSIPPI AND DOMINION STEAMSHIP COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag	Gross tons.	Material.	Year built.	No. crew.	Value.
Vancouver	British	5,231	Iron	1884	100	$389,600
Labrador	do	4,737	Steel	1891	100	389,600
Oregon	do	3,672	Iron	1882	70	194,800
Sarnia	do	3,694	do	1882	70	194,800
Toronto	do	3,316	do	1880	65	121,750
Dominion	do	3,176	do	1873	40	121,750
Ontario	do	3,175	do	1874	40	121,750
		27,001			485	1,534,050

2. ALLAN LINE.

Parisian	British	5,359	Steel	1881	70	
Mongolian	do	4,750	do	1891	70	
Numidian	do	4,750	do	1891	70	
Laurentian	do	3,983	Iron	1872	70	
		18,842			280	[$1,500,000]

3. DONALDSON LINE.

Amarynthia	British	3,953	Steel	1881		
Alcides	do	3,345	do	1886		
Warwick	do	2,527	do	1882		
		9,805			[125]	[$700,000]

EASTPORT, ME.

International Steamship Company (American).—Passenger service, three round trips per week to Boston, St. Johns, New Brunswick, via Eastport; via Portland, Me., every other trip. Capital stock, $300,000; chiefly American.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Cumberland (b)	American	1,606	Wood	1885	50	$200,000
State of Maine (b)	do	1,410	do	1881	50	170,000
New Brunswick (b)	do	925	do	1860	40	20,000
		3,941			140	390,000

NEWPORT NEWS, VA.

Chesapeake and Ohio Steamship Company, Limited (American).—Capital stock, $1,250,000, in part owned by the Chesapeake and Ohio Railway. Freight service every 10 days to London and Liverpool. Usual period of voyage, 12 to 14 days.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Rappahannock	British	3,883	Steel	1893	38	$250,000
Shenandoah	do	3,883	do	1893	38	250,000
Kanawha	do	3,883	do	1893	38	250,000
Appomattox	do	2,874	do	1893	33	170,000
Chickahominy	do	2,874	do	1893	33	170,000
Greenbrier	do	2,874	do	1893	33	170,000
		20,251			211	1,260,000

SAVANNAH, GA.

Antwerp Naval Stores Company (Belgian).—Monthly freight service to Antwerp. Period of voyage, about 20 days.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Iris	Belgian	2,333	Steel	1893	30	[$140,000]

NEW ORLEANS TO GREAT BRITAIN.

1. *West India and Pacific Steamship Company* (British).—Passenger and freight service to Liverpool 5 times a month during winter months; 3 times a month during summer months. Average voyage, 17 days; returning via Kingston, Colon, Central American and West Indian ports to New Orleans.

2. *Harrison Line* (British).—Regular freight service to Liverpool direct; also return via West Indies and Mexican ports.

3. *Cuban Steamship Line* (British).

NEW ORLEANS TO FRANCE.

4. *Chargeurs Réunis* (French).—Every 20 days to Havre.

NEW ORLEANS TO MEDITERRANEAN PORTS.

5. *Pinillos Line* (Spanish).

NEW ORLEANS TO WEST INDIES, MEXICO, AND CENTRAL AMERICA.

6. *Arthur Caron & Co.* (charterers).—Weekly freight service (fruit) to Boca del Toro.

7. J. L. Phipps & Co. (charterers).—Freight service (fruit) fortnightly to Costa Rican ports.

8. Southern Pacific Company (American).—Passenger and freight service weekly to Havana via Florida ports every 9 days to Brazos, Santiago, and varying service to Bluefields.

9. Macheca Brothers (Royal Belize Mail Steamship Company).—Mail and passenger service to British Honduras; also freight service (fruit) to Central American ports.

10. Oteri Lines, to Central American ports.

NEW ORLEANS TO GERMANY.

11. Hamburg-American Line (German).—Irregular service to Hamburg.

In addition to regular lines a large export grain trade is carried on from New Orleans in chartered vessels to various European ports, one firm loading annually 75 steamships, mainly British, averaging 3,000 registered tons each; average number of crew, 28; average value of steamers, $125,000. The steamers vary so that no regular list is possible. A large fruit import trade is also conducted by chartered vessels, mainly Norwegian.

1. WEST INDIA AND PACIFIC STEAMSHIP COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Barbadian	British	4,105	Steel	1893	44	$300,000
Bernard Hall	do	2,600	Iron	1880	40	150,000
Costa Rican	do	3,117	Steel	1885	42	250,000
Cuban	do	4,202	do	1891	40	280,000
Floridian	do	3,257	Iron	1884	42	250,000
Jamaican	do	4,501	Steel	1893	44	300,000
Louisianian	do	3,642	do	1891	44	280,000
Mexican	do	4,202	do	1891	40	280,000
Nicaraguan	do	3,642	do	1891	44	280,000
Texan	do	3,183	Iron	1883	42	280,000
West Indian	do	2,704	Steel	1891	40	250,000
William Cliff	do	3,287	do	1888	42	250,000
Yucatan	do	2,753	Iron	1882	40	200,000
		45,195			544	3,350,000

2. HARRISON LINE.

Astronomer	British	3,006	Iron	1883		
Chancellor	do	4,637	Steel	1891		
Electrician	do	2,847	do	1887		
Engineer	do	2,591	Iron	1882		
Governor	do	2,554	do	1881		
Inventor	do	2,222	do	1878		
Legislator	do	2,902	Steel	1888		
Navigator	do	2,510	do	1886		
Orion	do	3,242	do	1889		
Professor	do	2,522	Iron	1881		
Traveller	do	2,966	Steel	1888		
Vesta	do	3,055	Iron	1881		
Wanderer	do	4,086	Steel	1891		
		39,400			[450]	[$2,200,000]

3. CUBAN STEAMSHIP LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Cayo Romano	British	2,685	Steel	1893		
Cayo Rapado	do	2,700	do	1894		
Cayo Mono	do	2,756	do	1893		
		8,141			[125]	[$600,000]

4. CHARGEURS REUNIS.

Concordia	French	2,925	Steel	1889	40	$200,000
Colonia	do	2,925	do	1889	40	200,000
Cananas	do	3,242	do	1893	40	250,000
		9,029			120	650,000

5. PINILLOS LINE.

Catalina	Spanish	5,000	Steel	1893		
Conde Wilfredo	do	3,355	do	1889		
Martin Saenz	do	3,574	do	1890		
Miguel M. Pinillos	do	3,291	do	1885		
Pio IX	do	4,029	do	1887		
		19,449			[380]	$1,000,000

6. ARTHUR CARON & CO. (CHARTERERS).

Breifond	Norwegian	445	Iron	1890	14	
Agnes	do	432	do	1889	14	
Iberia	do	514	do	1891	14	
		1,391			42	[$80,000]

7. J. L. PHIPPS & CO.

Yumuri	Norwegian	844	Steel	1890	16	$60,000
Henry Dumois	do	1,032	do	1890	20	80,000
Albert Dumois	do	1,058	do	1891	22	80,000
Foxhall (*a*)	American	843	do	1885	26	60,000
		3,777			84	280,000

8. SOUTHERN PACIFIC COMPANY.

Clinton (*b*)	American	1,187	Iron	1862	27	
Wm. G. Hewes (*b*)	do	1,118	do	1865	27	
Gussie (*b*)	do	998	do	1872	27	
Whitney (*b*)	do	1,338	do	1871	30	
Aransas (*b*)	do	1,157	do	1877	30	
Algiers (*b*)	do	2,294	do	1876	60	
Morgan City (*b*)	do	2,299	do	1876	60	
		10,391			261	[$500,000]

9. MACHECA BROS. LINE.

Breakwater (*b*)	American	1,065	Iron	1880		
City of Dallas (*b*)	do	915	Wood	1872		
Clearwater	British	1,147	Steel	1894		
Rover (*a*)	American	725	Iron	1881		
Stillwater (*a*)	do	1,020	Steel	1883		
Shearwater	British	920	do	1888		
Wanderer (*b*)	American	539	Wood	1879		
Goldsworthy (*a*)	do	106	Iron	1881		
		6,437			[150]	[$300,000]

10. S. J. OTERI LINE.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Prof. Morse (*a*)	American	1,025	Steel	1866	.....	.....
S. Pizzati (*b*)	....do	1,027	Wood	1868	.....	.....
S. Oteri (*a*)	....do	900	Iron	1881	.....	.....
Joseph Oteri, jr. (*a*)	....do	484	....do	1878	.....	.....
		3,436	.....	.....	[80]	[$150,000]

11. HAMBURG-AMERICAN LINE.

Cheruskia	German	3,372	Steel	1890	.....	.....
Colonia	....do	2,925	....do	1889	.....	.....
Cremon	....do	2,067	Iron	1871	.....	.....
Grasbrook	....do	2,067	....do	1882	.....	.....
Holsatia	....do	1,867	....do	1880	.....	.....
Kehrweider	....do	2,893	....do	1871	.....	.....
Stubenhuk	....do	2,943	Steel	1890	.....	.....
Valesia	....do	2,333	Iron	1882	.....	.....
		20,467	.....	.....	[350]	[$900,000]

PENSACOLA TO WEST INDIES, MEXICO, AND CENTRAL AMERICA.

Export Coal Company (chartered vessels).—Irregular freight service (coal) to Havana, Vera Cruz, and Tampico. Capital stock, $227,000; all American capital.

EXPORT COAL COMPANY.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Scythian	British	240	Steel	1885	13	$20,000
Amethyst	....do	1,357	Iron	1878	22	45,000
Teutonia	....do	2,376	....do	1881	29	75,000
Hector	....do	2,040	....do	1887	27	40,000
		6.013	.....	.....	91	180,000

TAMPA TO WEST INDIAN PORTS.

Plant Line (American).—Capital stock, $1,000,000. Biweekly to Havana during the summer; during the winter, weekly from Boston to Halifax.

PLANT STEAMSHIP LINE.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Mascotte (*b*)	American	900	Iron	1885	46	$200,000
Olivette (*b*)	....do	1,600	....do	1887	50	300,000
Florida (*a*)	....do	1,600	Steel	1887	40	175,000
Halifax	British	1,738	....do	1888	50	175,000
		4,938	.....	.....	186	850,000

SAN FRANCISCO TO CHINA AND JAPAN.

1. *Pacific Mail Steamship Company* (American).—Capital stock, $20,000,000. Express and passenger mail service to Yokohama and

Hongkong, occasionally calling at Honolulu. Average period of round trip, 7 weeks. (*See also* New York.)

NOTE.—The company also has lines connecting Panama with Mexican and Central American ports, not touching the United States.

2. Occidental and Oriental Steamship Company (British).—Express, passenger, and mail service, alternating with Pacific Steamship Company's lines.

SAN FRANCISCO TO PANAMA.

[*1.*] *Pacific Mail Steamship Company* (American).—Express, passenger, and mail service, connecting, via Panama Railroad, with Atlantic service to New York.

3. Panama Steamship Line (American).—Chartered by the Panama Railroad Company. Express, passenger, and mail service, connecting, via Panama railroad, with Columbian Line, New York.

SAN FRANCISCO TO BRITISH COLUMBIA AND ALASKA.

4. Pacific Coast Steamship Company (American).—Capital stock, $2,000,000. Passenger and freight service 3 times a month to Alaska. Usual period of voyage, 14 days.

To British Columbia and Puget Sound: Passenger and freight service every 5 days. Usual period of voyage, 11 days.

To Ensenada, Mexico: Monthly passenger and freight service.

SAN FRANCISCO TO HONOLULU, AUSTRALIA, AND NEW ZEALAND.

5. Oceanic Steamship Company (American).—Express, passenger, and mail service 3 times a month to Honolulu; once a month to New Zealand and Australia.

1. PACIFIC MAIL STEAMSHIP COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
CHINA AND JAPAN.						
City of Peking (*b*)	American	5,080	Iron	1874		$837,939.02
City of Rio de Janeiro (*b*)	do	3,548	do	1878		543,844.24
Peru (*b*)	do	3,528	Steel	1892		626,474.09
China	British	4,940	do	1889		780,956.00
TO PANAMA.						
Acapulco (*b*)	American	2,572	Iron	1873		388,255.03
City of Sydney (*b*)	do	3,017	do	1875		463,883.00
Colima (*b*)	do	2,906	do	1473		438,514.84
Colon (*b*)	do	2,686	do	1873		401,161.56
San Blas (*b*)	do	2,075	do	1882		318,542.39
San Jose (*b*)	do	2,081	do	1882		313,162.15
San Juan (*b*)	do	2,076	do	1882		320,337.22
PANAMA, MEXICO, AND CENTRAL AMERICA.						
Barracouta	British	1,659	Steel	1883		254,260.00
City of Panama (*b*)	American	1,490	Iron	1873		234,787.47
Costa Rica (*b*)	do	1,783	do	1891		249,620.00
Starbuck (*a*)	do	2,157	do	1881		316,632.40
		41,598			[1,500]	6,488,360.41

2. OCCIDENTAL AND ORIENTAL STEAMSHIP COMPANY.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Gaelic	British	4,206	Steel	1885		
Belgic	do	4,212	do	1885		
Oceanic	do	3,808	Iron	1870		
		12,226			[350]	[$900,000]

3. PANAMA STEAMSHIP LINE (P. R. R. CO., CHARTERERS).

Saturn (*b*)	American	2,268	Iron	1890		$200,000
Progreso (*a*)	do	1,919	Steel	1885		175,000
		4,187			[100]	375,000
Keweenaw (*b*)	do	2,511	Steel	1891	[50]	[250,000]

4. PACIFIC COAST STEAMSHIP COMPANY.

City of Puebla (*b*)	American	2,624	Iron	1881	77	$300,000
Umatilla (*b*)	do	3,070	do	1881	81	350,000
Walla Walla (*b*)	do	3,070	do	1881	81	350,000
City of Topeka (*b*)	do	1,057	do	1884	44	92,500
Queen (*b*)	do	2,728	do	1882	103	375,000
Saint Paul (*b*)	do	888	do	1875	36	85,000
		13,437			422	1,552,500

OCEANIC LINE.

Alameda (*b*)	American	3,158	Iron	1883		
Australia (*a*)	do	2,755	do	1875		
Mariposa (*b*)	do	3,159	do	1883		
Monowai	British	3,433	Steel	1890		
Zealandia	Hawaiian	2,489	do	1875		
		14,994			[450]	[$1,500,000]
DUNSMUIR LINE.						
Costa Rica	Nicaraguan	1,983	Iron	1875	[35]	[80,000]
CHANDLER LINE.						
Empire (*b*)	American	732	Wood	1873	[20]	[30,000]

PORT TOWNSEND (TACOMA, PORT OF CALL).

Northern Pacific Steamship Company (British).—Connected with the Northern Pacific Railroad. Passenger and freight service once in 3 weeks to Hongkong, Shanghai, Kobe, and Yokohama.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Tacoma	British	2,550	Iron	1870	53	
Sikh	do	2,672	Steel	1889	53	
Victoria	do	3,167	Iron	1870	53	
		8,389			159	[$400,000]

SAN DIEGO.

Lower California Development Company (British).—Capital stock, $1,700,000. Six trips monthly to Ensenada and St. Quentin.

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Manuel Dublan	Nicaraguan	436	Wood	1888	20	$25,000
Carlos Pacheco	do	172	do	1886	16	15,000
		608			36	40,000

LOS ANGELES.

Occasionally to British Columbia.

[(*a*) Foreign-built vessel, admitted to American registry; (*b*) built in the United States. Figures in brackets [ ] are approximate.]

Name.	Flag.	Gross tons.	Material.	Year built.	No. crew.	Value.
Mineola (*a*)	American	2,438	Steel	1887	40	$200,000

REGISTERED STEAM VESSELS OF THE UNITED STATES.

Following is a complete list of the registered steam vessels of the United States which have not been included in the foregoing compilation, except 57 steamers (chiefly wooden) of less than 100 tons each, aggregating 4,000 gross tons. These ply chiefly on Puget Sound, the Mexican border, and are registered merely on account of the propinquity of foreign territory. They are mainly ferryboats rather than vessels engaged in foreign trade in the broad sense of the word.

Of the vessels tabulated below, many, though registered, have been engaged in coastwise trade, and thus were not returned as means of regular communication between the United States and foreign countries; others are steam whalers on the Atlantic and Pacific, and others, though retaining, of course, their registers, have not been in trade during the year. Others have been one or two voyages to the West Indies, but have not been regularly employed in foreign trade. It is possible that three or four have been regularly employed in foreign trade to the West Indies, Mexico, etc., and were omitted in the replies of owners to the request of the Bureau for information on which the foregoing tabulation was based.

Name.	Tons.	Material.	When built.	Where built.
Boston, Mass.:				
Carroll	1,372	Wood	1862	New York, N. Y.
Morning Star	471	....do	1884	Bath, Me.
Worcester	1,332	....do	1841	New York, N. Y.
New Bedford, Mass.:				
Navarch	494	....do	1892	Bath, Me.
New York, N. Y.:				
Atrato	156	....do	1879	Boston, Mass.
Britannia	115	....do	1879	Newburg, N. Y.
Rescue	153	....do	.....	Philadelphia, Pa.
Alamo	2,942	Iron	1883	Chester, Pa.
Clyde	2,016	....do	1870	Philadelphia, Pa.
Concho	3,724	Iron and steel	1891	Chester, Pa.
El Paso	3,531	Iron	1884	Philadelphia, Pa.
El Monte	3,531	....do	1886	Do.
Lampasas	2,942	....do	1883	Chester, Pa.
Neptune	880	....do	1873	England.
Chalmette	2,982	....do	1879	Philadelphia, Pa.
Excelsior	3,263	....do	1882	Wilmington, Del.
Mount Waldo	324	Wood	1886	Bath, Me.
Orinda	112	....do	1884	Camden, N. J.
Philadelphia, Pa.:				
Gladisfern	110	Iron	1883	Do.
Bolivar	234	....do	1885	Philadelphia, Pa.
Tampico	134	....do	1885	
Norfolk, Va.:				
South Portland	622	....do	1883	England.
Charleston, S. C.:				
Herbert	157	Wood	1884	Rocky Hill, Conn.
Pensacola, Fla.:				
Carbonera	361	Iron	1890	Camden, N. J.
New Orleans, La.:				
B. D. Wood	151	....do	1892	Philadelphia, Pa.
Morgan	994	....do	1865	Wilmington, Del.
New York	2,309	....do	1875	Do.
W. G. Wilmot	159	Steel	1892	West Bay City, Mich.
Mabel Comeaux	160	Wood	1883	New Richmond, Ohio.
Galveston, Tex.:				
Pearl Rivers	106	....do	1878	Gainesville, Miss.
Brownsville, Tex.:				
Santiago	168	Iron	1881	St. Louis, Mo.
Nogales, Ariz.:				
Gila	236	Wood	1872	San Francisco, Cal.
Mohave	188	....do	1875	Do.
San Diego, Cal.:				
Santa Fe	164	Wood	1888	San Diego, Cal.
San Francisco, Cal.:				
Bertha	614	....do	1888	Benicia, Cal.
Crescent City	296	....do	1882	San Francisco, Cal.
Dora	218	....do	1880	Do.
Haytian Republic	1,089	....do	1885	Bath, Me.
Jessie H. Freeman	516	....do	1883	Do.
Jeamie	1,071	....do	1883	Do.
Jeanette	290	....do	1893	Benicia, Cal.
Karluk	294	....do	1884	Do.
Mary D. Hume	164	....do	1881	Ellensburg.
Newport	281	....do	1875	San Francisco, Cal.
Santa Maria	344	....do	1884	Do.
Yaquina	355	....do	1881	Portland, Oreg.
Beluga	508	....do	1882	Bath, Me.
Balaena	523	....do	1883	San Francisco, Cal.
Grampus	326	....do	1886	Do.
Narwhal	523	....do	1883	Do.
Orca	628	....do	1882	Do.
Thrasher	512	....do	1883	Bath, Me.
El Primero	102	Steel	1893	
Belvedere	440	Wood	1880	Do.
William Baylies	380	....do	1886	
Willamette	2,562	Iron	1881	Chester, Pa.
Astoria, Oreg.:				
Chilcat	142	Wood	1890	Astoria, Oreg.
Port Townsend, Wash.:				
City of Quincy	195	....do	1878	Willamette, Oreg.
Columbia	529	....do	1891	Little Dallas, Wash.
Cyrus Walker	241	....do	1864	San Francisco, Cal.
Edith	198	....do	1882	Do.
Eliza Anderson	275	....do	1859	Portland, Oreg.
Evangel	164	....do	1882	Seattle, Wash.
Favorite	269	....do	1868	Utsaladdy, Wash.
Garland	101	....do	1890	Port Townsend, Wash.
Goliah	235	....do	1849	New York, N. Y.
Geo. E. Starr	472	....do	1879	Seattle, Wash.
Island Belle	207	....do	1892	Ballard, Wash.
Idaho	278	....do	1860	Cascade, Wash.

Name.	Tons.	Material.	When built.	Where built.
Port Townsend, Wash.—Continued.				
J. E. Boyden	102	Wood	1888	Seattle, Wash.
Mogul	123	....do	1886	Tacoma, Wash.
Mabel	156	....do	1889	Seattle, Wash.
Monticello	226	....do	1892	Ballard, Wash.
Politkofsky	255	....do	1868	Sitka, Alaska.
Richard Holyoke	181	....do	1877	Seabeck, Wash.
Rainier	103	....do	1877	Seattle, Wash.
Rapid Transit	164	....do	1891	Port Hadlock, Wash.
Rosalie	318	....do	1893	Alameda, Cal.
S. L. Mastic	213	....do	1869	Port Discovery, Wash.
State of Washington	605	....do	1889	Tacoma, Wash.
Skagit Chief	345	....do	1887	Do.
Tacoma	239		1876	San Francisco, Cal.
Tyel	316	Wood	1884	Port Ludlow, Wash.
Utopia	423	....do	1893	
Wm. F. Munroe	181	....do	1883	Seattle, Wash.
W. K. Merwin	229	....do	1883	Do.
Washington	292	....do	1881	Vancouver, Wash.
Wanderer	212	....do	1890	Port Blakeley, Wash.
Wasco	280	....do	1887	Hood River, Oreg.
Yakima	173	....do	1874	Port Gamble, Wash.
Fleetwood	134	....do	1881	Portland, Oreg.
Flyer	427	....do	1891	Do.
North Pacific	488	....do	1871	San Francisco, Cal.
Sehome	692	....do	1889	Portland, Oreg.
Signal	475	....do	1887	North Bend, Oreg.
Willapa	333	....do	1891	Portland, Oreg.
City of Kingston	1,117	Iron	1884	Wilmington, Del.
City of Seattle	1,411	....do	1890	Philadelphia, Pa.
Pioneer	160	....do	1878	Do.
Sea Lion	185	....do	1884	Camden, N. J.
Sitka, Alaska:				
Alaskan	155	Wood	1886	Seattle, Wash.

APPENDIX B.

DUTCH GUIANA.[1]

RAILWAYS AND HIGHWAYS.

There are no railroads whatever in this colony, and there are very few good roads. All the internal communication is by water. Transporting of produce from the estates is done by lighters carrying from 15 to 20 tons; these lighters are also used in carrying supplies to the various estates.

COASTWISE AND INTERIOR LINES.

A small steamer, run by the Colonial Government, plies between Paramaribo and the estates up the Surinam and Commewyne rivers, a distance of about 60 miles. There is also another Government steamer plying between the Saramaca River and Paramaribo weekly, a distance of 50 miles.

There are three launches, owned by private parties, running from Paramaribo, about 80 miles, to Buschland, the entrance to the gold fields. These launches carry passengers and tow freight boats.

The Colonial mail steamer *Curaçao* leaves Paramaribo twice a month for Demerara, British Guiana, via Nickerie and Coronie, districts of

[1] Received too late for insertion at its proper place.

this colony. The steamer connects at Demerara with the royal mail steamer from Europe, via Barbados, and also brings the correspondence from the United States and the various West India islands. A new steamer is expected this year, when the connection will be made at Barbados instead of Demerara.

OCEAN LINES.

Royal West Indian Mail (*Koninklijke West Indische Mail Dienst*).—This is a stock company formed in Amsterdam and subsidized by the Dutch Government. Steamers sail every three weeks from Amsterdam direct to Paramaribo; thence to New York, via Demerara, British Guiana; Trinidad, Carupano, Cumana, Guanta, La Guayra, and Porto Cabello in Venezuela; Curacao, Jacmel, Aux Cayes, and Port au Prince, in Haiti. They return to Paramaribo from New York over the same route and go from Paramaribo via Havre to Amsterdam. These steamers carry through mails to the United States and Europe.

The line consists of six steamers, viz:

Name.	Tonnage.	Name.	Tonnage.
Prins Willem I	1,950	Prins Willem IV	1,950
Prins Willem II	1,950	Prins Frederik Hendrik	1,600
Prins Willem III	1,950	Prins Maurits	1,300

The boats are all nearly new and in good condition, and, with the exception of the *Prins Maurits*, are fitted with electric light.

The passenger rates are $80 to New York, and the rate of freight is from $6 to $8 per ton delivered in New York.

Compagnie Générale Transatlantique.—This company has a branch line for West Indian service. The steamer which goes through to Colon meets at Martinique, West Indies, an annex steamer which proceeds to Cayenne, French Guiana, via St. Lucia, Trinidad, Demerara, and Paramaribo, arriving at the latter place about the 28th of each month; returning, the annex arrives at Paramaribo on the 4th of the following month, returning by the same route, carrying mails and passengers for Europe.

The annex steamers are the *Venezuela*, of about 800 tons, and the *St. Domingue*, of about 800 tons. These steamers take neither passengers nor freight to the United States.

Scrutton's Direct Line (London steamers).—This line consists mostly of chartered vessels, leaving London, via Dartmouth, England, about once a month for this port via Demerara and Berbice, British Guiana, returning by the same route. The steamers carry freight and passengers to Europe and the ports mentioned in British Guiana; they take no freight or passengers to the United States.

Trinidad Line (George Cristall & Co., New York, proprietors.)—Steamers leave New York about every two weeks for Trinidad, via

Grenada. At Trinidad an annex steamer takes freight and passengers to this port and Demerara. These steamers carry through mails from the United States.

The steamers from New York are, at present, the *Irrawaddy*, of 2,600 tons, and the *Gulf of Akaba;* the *Bratten*, of 800 tons, is used on the annex.

Passenger rate to New York is $80; round trip, $140; to Trinidad, $25, and to Demerara, $10.

Freight on cocoa to New York is $7 per ton, and on sugar according to market. The rate from New York is estimated at 50 cents per dry barrel.

This line expects some new steamers, which will come direct from New York to this port, returning to New York via Demerara and Trinidad.

ELI VAN PRAAG,
Vice-Consul.

PARAMARIBO, *June 15, 1895.*

APPENDIX C.

SPAIN.[1]

RAILWAYS.

The Spanish railway lines are controlled by corporations. The most important are: (1) The Northern Railway Company, (2) the Madrid-Zaragoza-Alicante Railway Company, (3) Andalusian Railway Company, (4) Madrid, Caceres and Portugal Railway Company, (5) the Tarragona, Barcelona and France Railway Company, and (6) the Algeciras (Gibraltar) Railway Company, Limited.

The condition of the Spanish railway lines is rather unsatisfactory both with regard to the comfort and the safety of passengers. There are three classes of passenger cars. The first class may be compared, as far as comfort is concerned, with the second-class French car.

In consequence of a collision which took place at Quintanilleja, on the Northern line, about three years ago, the Government issued a royal decree ordering all railway lines to use vacuum brakes on all passenger trains running at a speed of 50 kilometers (31 miles) per hour, and alarm electric bells. Only express trains reach this speed, as a general rule, but it frequently happens that ordinary passenger trains, being behind time, exceed this speed in order to make up lost time. On the Northern Railway line vacuum brakes are attached to express trains only. On the Madrid, Alicante and Zaragoza line they are used both on express and ordinary trains (mail).

---

[1] Received too late for insertion at its proper place.

As to the alarm electric bells, the railway companies have failed as yet to carry out the Government decree.

All Spanish railways have only one track.

From Madrid to the French frontier (Hendaye), one express train runs daily during the winter season and two during the summer (July, August, and September). From Madrid to Corunna, Gijon, Santander, and Bilbao one express train runs daily. On the Madrid, Zaragoza and Alicante line there are one daily express train and one extra express train three times a week. On the Madrid, Caceres and Portugal line there is one daily express train. The European International express runs three extra express trains per week. From Paris the train leaves for Madrid on Mondays, Wednesdays, and Saturdays, and for Lisbon on Wednesdays and Saturdays.

With respect to the freight on the Northern line, the rates range from 0.12 to 0.3 peseta per ton per kilometer (0.62137 mile). On the Madrid, Alicante, Zaragoza and Barcelona line the rates range from 0.15 to 0.4 peseta per ton per kilometer.

With regard to railroads overcoming great obstacles, a list of the tunnels and bridges on the Northern Railway line and on the Andalusian Railway is given herewith.

On the Madrid-Trun line, the highest station is La Canada, 1,359 meters (4,459 feet) above the level of the sea, situated at 92 kilometers (57.17 miles) from Madrid, the altitude of which is 595 meters (1,953 feet). On the Madrid, Leon and Gijon line, there is a station called Busdongo, the altitude of which is 1,197 meters (3,927 feet), being 117 kilometers (72.7 miles) distant from Gijon, the grade between both stations, Gijon and Busdongo, being 10.20 meters per kilometer (33.46 feet per 0.62137 mile).

Distances to termini and main points touched.

NORTHERN RAILWAY SYSTEM.

[NOTE.—Parallel lines indicate terminal points of divisions and branches.]

From Madrid to—	Distance.	Fare.	From Madrid to—	Distance.	Fare.
	Kilometers.	*Pesetas.a*		*Kilometers.*	*Pesetas.a*
Alar	415	48.95	Miranda	453	52.10
Reinosa	448	53.50	Orduña	517	59.50
Santander	503	61.10	Dos Caminos	551	63.40
			Bilbao	557	64.10
Segovia	101	11.65			
Palencia	284	32.70	Segovia	101	11.65
Orense	691	76.50	Medina	186	22.00
Vigo	823	91.68	Burgos	363	41.75
			San Sebastian	614	70.65
Palencia	284	32.70	Hendaye	633	72.80
Lugo	716	82.40			
Corunna	831	83.00	Leon	407	46.85
			Gijon	578	64.55

Distances to termini and main points touched—Continued.

SOUTHERN RAILWAY SYSTEM.

[NOTE.—Parallel lines indicate terminal points of divisions and branches.]

From Madrid to—	Distance.	Fare.	From Madrid to—	Distance.	Fare.
	Kilometers.	*Pesetas.a*		*Kilometers.*	*Pesetas.a*
Alcazar	148	17.05	Talavera	134	15.55
Alicante	455	52.35	Plasencia	251	29.40
Zaragoza	372	42.30	Valence de Alcantara		
Barcelona	713	81.55	Elvas	401	50.00
Cordova	441	50.85	Badajos		58.65
Seville	574	66.05	Lisbon	799	82.65
Jerez	678	78.00	Aranjuez	40	7.40
Cadiz	727	84.25	La Encina	377	43.40
Cordova	441	50.85	Jativa	435	50.25
Seville	572	65.95	Valencia	490	58.75
Huelva	681	79.90	Cordova	441	50.85
			Malaga	634	75.30

a 1 peseta = 19 3 cents United States currency.

Tunnels.

NORTHERN RAILWAY SYSTEM.

[NOTE.—1 kilometer = 0.62137 mile; 1 meter = 39.37 inches.]

Name of tunnel.	Length.	Name of tunnel.	Length.
	Kilom. met.		*Kilom. met.*
Campo del Moro	0 909	Santander line:	
Madrid-Hendaye line:		Reinosa	1 276
Torrelodones	0 286	Cañada	0 471
Portachuelo	0 264	Cubertoria	0 236
Paradilla	0 681	Montabliz	0 675
Conejero	0 323	Asturias line:	
Cañada	0 747	Corro la Tienda	0 227
Navalgrande	1 004	Serrin	0 270
Primero de la Brujula	1 042	Mieres	0 244
Segundo de la Brujula	0 222	Laguna	0 378
Cuarto de la Brujula	0 408	Pandolo	0 308
San Roque	0 219	Topeal	0 332
Primero de Ameyugo	0 224	Pisona	1 024
Chinehetre	0 540	Resgosa	0 242
Otzaurte	1 157	Ranero	0 470
Rosa Aria	0 228	Troneos	0 331
Salinas	0 359	Cuchitin	0 535
Asineta	0 725	Establon	0 429
Ustaran	0 367	Mudrielo	0 376
Osina	0 706	Gramea	0 659
Oazurza	2 956	Navidiello	0 258
Brincola	0 276	Valvenir	0 642
Primero de la Zumarraga	0 718	Ventanoso	0 756
Cuarto de la Zaizabal	0 464	Peñas Agudas	0 263
Quinto y sexto de la Erizmendi	0 542	Valdecales	0 316
Séptimo de la Ormaiztegui	0 234	Sorda	1 075
Octavo bis Arrazabal	0 417	Bosnacil	0 346
Isasondo	0 281	Collada-Congostinas	0 294
Legorreta	0 411	La Sotera	0 205
Teastequieta	0 518	El Tuero	0 320
Arrabalza	0 290	Perrerca	3 077
Andoain	0 304	Estillero	0 233
Urnieta	1 001	Pallariega	0 904
Loyola	0 290	Corallon	0 314
Gainchurrisquita	0 534	Peña-Negra	0 299
Villalba-Segovia line:		Galanes	0 410
No. 1	0 220	Galicia line:	
No. 3	2 380	No. 5	0 484
Galicia line:		No. 9	0 622
No. 1	0 602	No. 13	0 206
Villabona-Aviles line:		El Lazo	1 042
Terroñes	0 300	No. 17	0 520

Tunnels—Continued.

NORTHERN RAILWAY SYSTEM—Continued.

[NOTE.—1 kilometer=0.62137 mile; 1 meter=39.37 inches.]

Name of tunnel.	Length.		Name of tunnel.	Length.	
Galicia line—Continued.	*Kilom.*	*met.*	Galicia line—Continued.	*Kilom.*	*met.*
No. 26	1	007	Congostinas Loda	1	822
No. 28	0	246	Orria	1	061
No. 29	0	220	Batan	0	305
No. 30	0	307	El Padrun	1	726
No. 33	0	584	Calayo	0	703
Cobas	0	718	Fresno	0	427
Perido	0	317	Robledo	0	898
Atalea	0	483	Santander line:		
Bustelos	0	278	Negro	0	296
Peña del Burro	0	230	Gustazoso	0	351
Quereño	0	349	Moran (Cotio)	0	222
La Barja	0	223	Hijando	0	242
Pedreiras	0	300	Pujayo	0	593
Monteaforado	0	402	San Lorenzo	0	270
San Roman	0	310	Las Llosas	0	245
Rajros	0	220	Somathoz	0	298
Cobas	0	534	Castejon-Bilbao line:		
San Pedro de Lor	0	235	No. 1	0	375
De Casti	0	211	No. 2	0	203
La Marquesa	0	418	No. 3	0	984
Treiras	0	995	Alsasua-Zaragoza-Barcelona line:		
Cuatro	0	254	Lastanosa	0	327
Oural	1	963	Segur	0	259
San Alberto	0	223	San Pedro	0	203
La Tieira	0	229	Segues	0	424
Seiros	0	234	Santamans	0	432
Pasajes	0	424	Manresa	0	364
Congostinas	1	168	Grande de Torellat	0	608
Royadoz	0	220	Lerida-Tarragona line:		
Las Cruces	0	385	No. 1	0	733
Bustiello	0	889	Barcelona-San Juan de las Abadesas line:		
Coerada	0	223	Escala	0	427
Valdehaces	0	285			

ANDALUSIAN RAILWAYS.

Malaga-Cordova line (123 miles):			Malaga-Cordove line—Continued.		
Boabdilla-Gobantes	0	358	Rio Frio-Laja (3 tunnels), longest	0	160
Gobantes-El Chorro (11 tunnels), longest	0	839	Marthena-Cordovaline (56.54 miles):		
Alora-Pizarra	0	189	Gudaleazer-Valchillon	0	327
Cordova-Balamzona (4 tunnels), longest	0	315	Puente Genil Linaves (109.36 miles):		
Obejo-Alhondiquilla (3 tunnels), longest	0	230	Cabra-Da Mencia	0	140
			Torre Don Jimeno-Torredel Campo	0	334

Bridges.

NORTHERN RAILWAY.

Leon Gijon line: Across the Caudal, the Nalon, and the Nora.

Zaragoza-Alsasua line: Across the Ebro, the Aragon, and the Imperial Canal.

Zaragoza-Barcelona line: Across the Gallego, the Cinca, the Segre, and the Llobregat.

Lerida-Tarragona line: Across the Franioli.

Madrid-Iron line: Across the Duero and the Oyzarzun.

Segovia-Medina line: Across the Eresma, the Voltoya, and the Adaja.

Palencia-Coruña line: Across the Sil (4), the Burbia, the Neira, the Tordia, and the Miño (a viaduct), the Ladra, and the Parga (2).

ANDALUSIAN RAILWAYS.

Lines.	Number of bridges.	Length.	Over the—
Malaga-Cordova (123 miles):		*Meters.*	
Malaga-Valchillon	1	204	Guadalquivir.
Valchillon-Torres	1	64	La Torrecilla.
Cabrera	2	35, 45	Fuensequilla.
Cubrera-Munez	1	58	Las Arcas.
Puente Genil-Casarriba	1	133	Genil.
Bobadilla-Gobantes	1	42	Vad Yeso.
Gobantes-El Chorro	2	39, 69	Mellizas.
Alora-Pizarra	1	83	Pizarra.
Cordova-Belmez (44.11 miles):			
Cordova-Ballenzona	1	152	Puente Pedruche.
Obeja-Alhondiguilla	1	24	Do.
Villa Nueva del Rey-Cabeza Vaca	1	25	Do.
Bobadilla-Granada (75.8 miles):			
Salinas-Rio Frio	2	*a* 90	Rio Frio.
Illora-Pinos Puente	1	20	Do.
Pinos Puente-Atarfe	1	22	Do.
Sevilla-Jerez-Cadiz (102 miles):			
Sevilla-Dos Hermanos	1	36	Guadalquivir.
Puerto Santa Maria-Puerto Real	1	158	Gudalete.
Do	1	114	San Pedro.
Puerto Real-San Fernando	1	66	Borcadel Ave y el Aguila.
Do	1	99	Sante Petri.
Moron Utrera-Osuna (57.80 miles):			
Empalune-Atachal	1	20	
Marchena-Ojuelos	2	17, 25	
Osuna-La Roda (21.75 miles):			
Aguadulce-Pedrera	1	35	
Marchena-Cordova (56.55 miles):			
Guadalcazar-Valchilla	1	50	
La Carlota-Guadalcazar	2	50, 20	
Alicante-Murcia-Torrevieja (55.9 miles):			
Alicante-Santa Pola	1	45	Aguas Amargas.
Elche-Cuvillante	3	16, 24, 75	Vinalapa.
Calosa-Orchuela	1	40	Segura.
Beniel-Zenata	1	30	Regueron.
Albateria-Benjopar	1	40	Segura.
Puente Genil-Linares (109½ miles):			
Lucena-Cabra	1	70	Alameda.
Labra-Dª Mencia	2	25, 130	El Mayora La Seina.
Dª Mencia-Alcandeta	2	83, 205	Guadajos and Desgaradero.
Alcandeta-Vado Jaen	2	70, 70	Espinda and Vadojudio.
Do	1	222	Vivora.
Vadojaen-Martes	2	130, 206	Sierrayuelo and Salado.
Torre Don Jimeno-Torre del Campo	2	80, 102	Arrajuelo and Coballier.
Espetim-Bailen			Guadalquivir.

a Longest.

Difficulties of construction.—The Andalusian railways which have overcome great obstacles are the following:

The Cordova-Malaga line, on account of its numerous tunnels, bridges, and works across the Gaitanes Mountains, between Gobantes and Alora; the Bobadilla-Granada line, and also that of Cordova-Belmez; and the Puente Genil-Linares line.

Dates of inauguration.

Line.	Date opened.	Line.	Date opened.
Cordova-Malaga line:		Sevilla Jerez-Cadiz line—Cont'd.	
Cordova-Malaga	Sept. 16, 1863	Time consumed in building line, eight years.	
Alora-Cordova	Aug. 15, 1865	Utrera-Moron-Osuna line:	
Time consumed in building line, four years.		Moron-Marchena	Oct. 8, 1868
Cordova-Belmez line:		Marchena-Osuna	Apr. 17, 1875
Cordova-Alhondiguilla	Nov. 18, 1870	Utrera-Moron	Sept. 12, 1864
Alhondiguilla-Obeja	July 11, 1875	Time consumed in building line, one year.	
Obeja-Cordova	Sept. 5, 1875	Osuna-La Roda line	Feb. 24, 1878
Time consumed in building line, three years.		Time consumed in building line, one year.	
Bobadilla-Granada line:		Marchena-Cordova line:	
Bobadilla-Antequera	Aug. 20, 1865	Marchena-Eija	Sept. 20, 1879
Loja-Granada	Dec. 10, 1866	Eija-La Carlota	June 10, 1885
Antequera-La Peña	Aug. 14, 1869	La Carlota-Vachillon	Oct. 12, 1885
La Peña-Loja	Nov. 8, 1863	Time consumed in building line, one year.	
Time consumed in building line, seven years.		Alicante-Murcia Torrevieja line	June 18, 1884
Jerez to San Lucar and Bonanza:		Time consumed in building line, two and one-half years.	
Jerez-Alcubilla	Oct. 2, 1878	Puente Genil-Linares line:	
Alcubilla-San Lucar	Sept. 1, 1877	Espeluy-Jaen	Aug. 18, 1881
San Lucar-Bonanza	Sept. 12, 1884	Puente Genil-Cabra	June 18, 1891
Time consumed in building line, one year.		Cabra-Jaen	Jan. 22, 1893
Sevilla-Jerez-Cadiz line:		Espeluy-Linares	Do.
Jerez-Puerto Santa Maria	June 22, 1856	Time consumed in building line, one year; other part of line, six years.	
Puerto Santa Maria-Trocadero	Oct. 10, 1856		
Sevilla-Jerez	May 1, 1860		
Puerto Real-Cadiz	Mar. 1, 1861		
Cordova-Sevilla	Sept. 29, 1861		

F. FIGUEROA HERNANDEZ,
Vice-Consul.

MADRID, *July 30, 1895.*

APPENDIX D.

NEW TARIFF RATES OF AUSTRIAN STATE RAILWAYS.[1]

In former dispatches to the Department, I have explained what is called the zone system, the operation of which has been attended with remarkable success on the Hungarian railways, and it may be of some interest to know that the Austrian State railways have also made some reduction of rates and have recently adopted a new tariff scheme on that system in which the rates on second-class goods have been lowered to even less than those of the Northwestern Railway. It contains three classes, as follows:

Distance.	Class—		
	1.	2.	3.
0.62137 to 93.2 miles:	*Florins.**	*Florins.*	*Florins.*
Express train	5.25	3.25	1.75
Ordinary train	3.75	2.25	1.25
93.8 to 186.4 miles:			
Express train	5.15	3.15	1.65
Ordinary train	3.65	2.15	1.15
187 to 372.8 miles:			
Express train	5.00	3.00	1.50
Ordinary train	3.50	2.00	1.00
Over 372.8 miles:			
Express train	4.80	2.80	1.30
Ordinary train	3.30	1.80	.80

* 1 florin = 40 cents United States currency.

[1] Received too late for insertion at its proper place.

The calculation is based on the zone system. The first zone is formed by a distance of 10 kilometers (6.2 miles). From 10 to 50 kilometers (6.2 to 31 miles) the zones are formed by 5-kilometer (3.1 miles) divisions; over 50 kilometers, however, each zone is 10 kilometers (6.2 miles) long. The stamp duty is charged separately; it amounts to 2 kreutzers[1] per florin (40 cents), at the highest being 25 kreutzers for one ticket. In the first zone there are stipulated minimum prices; hence the journey up to 10 kilometers (6.2 miles) costs 12 kreutzers in the third class, 23 kreutzers in the second class, and 38 kreutzers in the first class carriages, exclusive of stamp duty.

The distance between two stations is found by the kilometer table.

In the transportation of goods, there is to be added a slight supplementary charge by mountain railways and railways of expensive construction, and it is unnecessary to make unit tariffs on these railway lines.

The new tariff is to go into operation on September 1, 1895.

EDWARD P. T. HAMMOND,
Consul.

BUDAPEST, *July 9, 1895.*

APPENDIX E.

INTERIOR WATERWAYS OF NORTHWEST EUROPE.[2]

In a report previously published, the principal harbors located on the North Sea and English Channel were described.[3] Every one of the cities mentioned, Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp, Havre, and others, is the terminus of a network of railways, rivers, and canals. A large share of the merchandise shipped abroad from these ports is transported by water from the place of origin to the side of the ocean steamer. Rivers and canal systems are the commercial highways of Continental Europe. These water routes still maintain their prestige, chiefly by reason of their economic advantages, while the comparatively short distances to be traversed are also in their favor.

A knowledge of the principal rivers and canals, upon which so many goods destined for our country commence their journey, should be valuable. Not only may such a description give an idea of European transportation facilities and charges, but it also should serve as an aid to the perfection of our own system. It is, therefore, with peculiar pleasure that I have just read a book upon this subject published by a

---

[1] 1 kreutzer equals two-fifths of a cent.

[2] Received too late for insertion at its proper place.

[3] See "North Sea and Channel ports," published in Consular Reports, No. 170, January, 1895.

civil engineer of this city. The author, Mr. Octave Mavaut, gives a succinct account of transportation facilities by water in France, Holland, Germany, and Belgium. I will review, as briefly as possible, the salient features of this treatise.

FRANCE.

France is certainly the country where the Government has intervened most liberally in favor of interior navigation. The works executed upon navigable waterways since 1880 have cost the sum of $87,000,000, and the relinquishment of the tolls represents also an annual sacrifice of several millions. It is interesting to note that the French Government has not done anything except to transform and improve the existing waterways. Of the 7,660 miles of navigable waterways which France possesses at present, there are scarcely 70 miles of canals recently constructed. Among them, however, we must mention the canal from the Oise to the Aisne, which greatly facilitates the relations between eastern France and Alsace-Lorraine, on the one hand, and northern France and Dunkirk on the other. The commercial importance of the various navigable ways is far from equal; indeed, 3,500 miles of the so-called principal water courses absorb more than 90 per cent of the total mileage traffic.

CANALIZATION OF THE SEINE.

The most considerable work of all this period has been the canalization of the lower Seine from Paris to Rouen, which has cost in round figures $11,600,000. This great work has only recently been completed by the construction of the canal from Tancarville to Havre, which has cost $3,860,000. The object has been to obtain at all times a depth of 10½ feet, affording shipping an available draft of 9 feet 11 inches, while establishing the necessary arrangements for active and easy navigation.

In the 155 miles which separate Paris from Rouen there have been constructed nine stations with removable and movable dams for the drainage of superfluous water, as well as locks to insure in ordinary times the regularity of navigation. At each dam there is a large lock affording in the sluice an available length of 462½ feet and a width of 55¾ feet, and also a smaller lock affording in its sluice an available length of 136½ feet and a width of 28½ feet. The results of these works are already considerable; for in five years—from 1886, the year of their completion, until 1891—the annual traffic on the lower Seine has increased from 217,000,000 to 399,009,000 "mile-tons." [1]

---

[1] This expression "mile-ton" means the carriage of 1 ton over the distance of 1 mile. We should be careful, however, not to understand it as meaning a certain number of tons per mile. For instance, 399,000,000 mile-tons does not mean that number of tons carried per mile; that figure is, on the contrary, the product of the total number of tons of merchandise multiplied by the totai length of the distance

The character of the boats and their means of propulsion have likewise been transformed. Besides the ordinary canal boats, which carry, at the maximum, 300 tons, specially large barges up to 1,000 tons in size have been constructed. Steam is exclusively employed for navigation; it alone operates the very complete output of towboats, using chains and magnetic adherent cables, as well as the tugs and coasting boats, which are in regular communication with London.

One remarkable feature of the lower Seine navigation is the regularity and swiftness of transportation. In this respect there are boats between Paris and Rouen which compete with the railway.

The price of freight between Rouen and Paris was, in 1890, upstream, 71½ cents per ton, and downstream, 51½ cents per ton.

IMPROVEMENT OF THE RHONE.

The improvement of the Rhone from the junction of the Saone at Lyons to the sea has been undertaken with an entirely different idea. Over a distance of 205 miles the improvement of the open river has been accomplished by a series of works wisely conceived and accurately executed. Before the works were commenced, in 1880, the minimum low-water mark was 15¾ inches. During 182 days of the year only did the available draft exceed 63 inches, within which time there were included 101 days during which it was more than 78.7 inches.

After twelve years of persevering efforts and an expenditure of $9,000,000, the following results have been obtained: The channel has been corrected; the falls have been lengthened, lessening the impetuosity of the rapids; dangerous rocks have been removed; the minimum draft now measures 55 inches, and there is an available draft of 63 inches during at least 354 days, and more than 78.7 inches during 310 days of the year. The only obstacle which the Rhone still presents to navigation arises from the violence of the current. It is hoped to remedy this by establishing a series of relays, fitted out with special tugs, drawn upstream by cables, to be wound around fixed drums operated by steam power. These cables would unwind for boats going downstream, and would allow an easy traction power, from which the best results are expected. The day, therefore, is soon coming when the Rhone, which seemed unconquerable, will be easily navigable, and will have an immense traffic.

The navigation of the Rhone is destined to immediately serve very important local interests. It is, moreover, impossible to estimate the importance of this route for international traffic. The Rhone, suitably

---

traversed. Thus, if the total of goods transported amounted to 5,500 tons and the distance carried was 50 miles, we should have a mile-tonnage of 275,000 tons. This definition should be borne in mind wherever the phrase appears in the course of this report. The original expression employed in French is "tonne-kilométrique." Mile-ton is the nearest equivalent phrase, the necessary reduction from kilometer to mile having been made.

connected on the one hand with Marseilles by a direct canal, and on the other with the navigable water courses of France, Belgium, and Germany, may be destined to become the principal commercial artery of northwestern Continental Europe for connection with the countries of the Mediterranean, the Indian Ocean, and the Far East.

DEVELOPMENT OF FRENCH CANALS.

The works executed upon the French canals, being almost exclusively in the line of improvement, appear comparatively modest alongside of the great improvement of the Seine and Rhone. The change accomplished in the last fifteen years, however, is not less considerable, and is in proportion with the hundreds of millions which have been devoted to that purpose. The object has been to reduce all canals of general importance to one single type, so as to render them practicable for the largest boats in use on French canals. The type of boat which predominates is the Flemish pinnace, or Walloon boat, of 300 tons. Its dimensions are: Length, 126 feet; width, $16\frac{1}{4}$ feet; draft, loaded, $5\frac{1}{4}$ feet. Boats of this type figure for 80 or 90 per cent of the total upon the northern and eastern canals. To permit the passage of these boats the sluices measure in available space: Length, 126 feet; width, 17 feet. The legal dimensions of the great French canals are not less than $32\frac{2}{3}$ feet in width at the bottom, $52\frac{1}{2}$ in width on the water surface, and $6\frac{1}{2}$ feet draft.

In 1878 only 288 miles of canals satisfied these conditions. In 1893 there were 1,353 miles. Such were especially all the canals of northern and eastern France. For a great many canals, moreover, these measurements have been increased, by reason of the importance of their traffic. Thus the canal from the Oise to the Aisne has a width of $32\frac{2}{3}$ feet at the bottom and a draft of $7\frac{1}{5}$ feet. The Scheldt Canal has a width of 36 feet at the bottom and a draft of $7\frac{1}{5}$ feet. The St. Quentin Canal, whose depth is the same, has a width of $39\frac{1}{3}$ feet. Upon certain canals the traffic is enormous. There pass, for instance, over the St. Quentin Canal, on an annual average, 3,500,000 tons of merchandise, and in some parts exceptionally frequented as much as 3,800,000 tons. The total annual traffic, therefore, for this single canal amounts to about 300,000,000 mile-tons, which is equal to almost half of the total traffic of all the Belgian waterways united. The traffic per mile is about 5,000,000 tons. The St. Quentin Canal has a length of 58 miles and 35 locks. At its summit-level pond there are two subterraneous passages, 3,609 and 18,700 feet in length. There is, moreover, a series of narrow passages in cuttings, with curves of short radius and great angular development. In order to meet the exigencies of such an important traffic upon canals where navigation is very difficult, the authorities have established a series of intelligent and practical regulations. Upon the northern and eastern canals and canalized rivers towage by hand power is prohibited for loaded boats,

and tolerated for empty boats only on condition that it be done by men of the crew. Towage on canals is mostly done by horses. On certain canals, as on the canal parallel to the Oise, private companies are established which furnish horses at a fixed price and by contract. On other canals, as on the St. Quentin Canal, the authorities have organized the towage along the canal and let it out to contractors upon certain stipulated conditions and by public adjudication. Finally, public authority itself operates the mechanical traction in use upon certain summit-level ponds which present exceptional difficulties for navigation. In this manner chain towage is operated on the summit-level pond of the St. Quentin Canal, on that of the canal connecting the Marne with the Rhine, in the tunnel of Ham, situated on a branch of the canalized Marne, and on the middle scarp in the Douai passage. The Government is about to establish the system of funicular towage invented by Maurice Levy upon the Aisne-Marne canal, in the Mount Billy tunnel near Reims. Last year it inaugurated, with remarkable success, electric towage—Pouilly system—upon the summit-level lake of the Bourgogne Canal, which includes a tunnel 10,829 feet in length.

Let us not forget the abolition of tolls voted in 1880; then the full importance of the works and useful measures decreed by the French Government in favor of the development of interior navigation will be easily understood. The latter has already largely profited by the favors which have been granted it.

From 1,247,095,000 mile-tons, which represented in 1880 the transportation movement upon French navigable waterways, the figures have risen to 2,117,400,000 mile-tons in 1891, while the price of freight per ton and per mile has dropped to three-tenths of a cent, and even less for long distances.

HOLLAND.

Interior navigation has not so great an importance in any other country as in Holland. There the boat is the predominant factor in transportation. Besides the admirable network of rivers which pass through the country, innumerable artificial navigable ways thread it. The system of canals for navigation has alone a development of 2,244 miles, while all the railway lines have only a total length of 1,511 miles.

It is, however, to be remarked that this system of navigable ways branches out very slightly into other countries; its connections do not extend beyond such communications as are established by the Rhine, the lower Scheldt, and the Bois le Duc-Maestricht Canal. The last, indeed, only supplements the navigation of the Meuse.

To maintain an influential commercial situation and to consolidate the sources of native activity, the country has applied a large portion of its means to the development of its shipping and seaports. Rotterdam and Amsterdam claim to handle almost exclusively the important maritime trade originating in the rich industrial regions adjacent to

the valley of the Rhine. The improvement of navigation toward and upon the Rhine forms an essential part of the programme; the present situation has been attained only after long and laborious work.

NAVIGATION FROM ROTTERDAM TO THE RHINE.

The Rhine, coming from Germany, crosses the Dutch frontier near Lobitts. About 6 miles lower down it divides into two branches, of which the more important in respect to navigation, the Wahal, passing by Nimeguen and Eich, mingles with the Meuse at Wondrichsem, 58 miles from the frontier. From their point of junction the Wahal and the Meuse continue, under the name of Meerwede, to Hardinxveld, several miles lower down, where there is another separation of their waters. The lower Meerwede flows on to Dordrecht, and from there to Rotterdam under the name of the Old Meuse and the "North;" the new Meerwede serves only as a great artificial drainage way to conduct the waters toward the Hollandsch Diep, where they pass under the well-known bridge of Moerdyk.

The course of the Rhine, including the Wahal and the Meerwede, has undergone important transformations. Instead of an irregular water course—strewn with islets and sand banks, presenting a series of shoals and deceptive channels, very often affording at low water only a depth of 1 meter or less—there now exists one of the most beautiful navigable ways to be seen. Its normal width is 1,180 to 1,312 feet, and the depth at low water, which will be increased everywhere to at least 9 feet 10 inches, is already 8 feet 10 inches, even when the depth registered on the bank at Cologne is only 5 feet, an event which occurs, on the average, not more than ten days in the year. The width of the navigable channel is 328 to 492 feet. The Meerwede has to-day a depth of 9 feet 8 inches or more to Dordrecht, and beyond the depth continues to increase to Rotterdam.

The works of improvement projected are chiefly the fixing of a minor bed by means of submerged piles and dredgings for the establishment of the channel. These improvements have cost, for the Upper Rhine, $569,871.10; for the Wahal, $5,028,788.70; for the Meerwede, $4,786,400, and for the Old Meuse, the North, the Mollegat, and the Spree, $1,002,152, which make a total sum of nearly $11,500,000. Other expenses are still to be incurred for finishing and consolidating the improvements heretofore made. Important dredgings and supplementary works at St. Andre are especially in view. In order to prevent any mixture of the waters of the Meuse with those of the Wahal, there is projected a new drainage course destined to carry off the water of the Meuse into Hollandsch Diep. In this manner navigation from Rotterdam to the Rhine will not be influenced by the changes in the Meuse; the ice floes which come down at the breaking up of this river will likewise be diverted from Rotterdam. From this description it

is seen that the Dutch are not neglecting any means of increasing the advantages and facilities of navigation between Rotterdam and the German ports of the Rhine.

NEW CANAL OF THE MEERWEDE.

Amsterdam, which has made for its port as many sacrifices as Rotterdam, had for a long time good communication with the Rhine by the Cologne Canal. This navigable way, formed by a series of special canals, the last of which was constructed in 1825, placed Amsterdam in communication with the Lek and the Meerwede. Its total length was 52 miles; the width at the bottom measured 42½ feet, and the depth was 8 feet. It was practicable for Rhine boats measuring 220 feet in length, 24½ feet in width, and having a draft of 6 feet 10 inches.

For several years past, as is well known, the dimensions of the Rhine boats have been increasing. They now frequently reach 266 feet in length and 34½ feet in width, with a draft of 8⅕ feet, their tonnage being 1,500 metric tons. A barge has recently been constructed at Slikkeveer which is 285½ feet in length and 35¾ feet in width, with 8½ feet draft and a carrying capacity of 1,750 metric tons.

In these conditions the Cologne Canal was considered insufficient, and has been replaced by the new canal from Amsterdam to the Meerwede. The greater part of the canal—from Amsterdam to the Lek, over a distance of 29 miles—is entirely new. On the other hand, the portion between the Lek and the Meerwede is a transformation of the former Cologne Canal. By the new canal the distance from Amsterdam to the Meerwede has been reduced to 44 miles. In certain portions of the canal the level is variable, but it offers always at the least a draft of 10 feet. The width at the bottom is at least 65½ feet. The locks of Utrecht, Vreeslyk, Vianen, Heenenhoek, and the Meerwede are 393¾ feet long and 39⅓ feet wide. The twin locks of Amsterdam are 46 feet wide. This superb canal cost $8,106,000; it was opened for traffic May 1, 1893.

DEVELOPMENT OF TRAFFIC.

The daily increasing importance of navigation between the Dutch maritime ports and the German ports of the Rhine amply justifies the considerable sacrifices which Holland is making to improve its communications with this latter river.

According to observations made at the German frontier station of Emmerich, the total trade with Holland and Belgium showed a movement, in 1881, of 26,803 boats, of which 17,894 were under the Dutch flag; in 1892, of 38,024 boats, of which 30,694 bore the Dutch flag. The 38,024 boats of 1892 represented an available tonnage of 11,975,389 cubic yards.

The traffic by the Rhine between Germany and Holland alone included a movement of 4,654,370 tons of merchandise in 1890 and of 5,423,418 tons of merchandise in 1893, an increase of 769,043 tons.

During the same years the traffic by water between Germany and Belgium amounted to 1,165,456 tons of merchandise in 1890 and 1,310,033 tons of merchandise in 1893 being an increase of only 144,577 tons of merchandise.

GERMANY.

THE GERMAN RHINE.

The Rhine is probably the most important interior waterway of Germany. Considering the relations with Dutch and Belgian ports, the total traffic of the Rhine attained in 1892 the figure of 20,793,000 tons of merchandise, of which total 16,480,000 tons represented interior transportation alone. In 1882 the total traffic was only 10,150,000 tons. The traffic therefore doubled in ten years.

In Germany the public works for the improvement of the Rhine are aiming to obtain between Mannheim and St. Goar an available depth of 6 feet 6½ inches; between St. Goar and Cologne, a depth of 8 feet 2½ inches, and below the last-mentioned city a depth of 9 feet 10 inches at the time when low water marks there only 4 feet 11 inches. Above Mannheim up to Strasburg there is only an available depth of 4 feet 4½ inches to 4 feet 11 inches, and sometimes, at low water, even less. Rhine boats are now frequently running with partial cargoes up to Strasburg. In this case they still carry from 300 to 600 tons of merchandise. With much less difficulty, small boats can ascend the Rhine as far as Hunningen, at the gates of Basel.

Towing by steam apparatus placed on the banks is organized between Bonn and Bingen, while steam-tug towing, which every day is on the increase, is strongly competing with it. The prices of tug towing upstream do not exceed on the average $0.00875 to $0.009 per ton for every mile. The fleet which carries on the traffic of the Rhine counts to-day 8,248 boats, of which number 7,530 are ordinary boats, representing a tonnage of 1,531,284, and 738 are steamers, whose total tonnage is 32,204. The value of this fleet is estimated at $4,632,000, and it employs a force of 21,678 men as crews.

One remarkable feature connected with the navigation of the Rhine is the development and perfect outfitting of the ports which are established along its route. Of forty-one ports of some importance, twenty-eight are connected with railways and provided with all the appliances necessary to expedite the transshipment of merchandise from boats to cars and vice versa. In respect to management and appliances, the ports of Ruhrort, Dusseldorf, Cologne, Mayence, Mannheim, and Frankfort on the Main have not any reason to be envious of the most modern seaports. Quays, sheds, warehouses, cranes, granaries with elevators, and silos for grain, separate establishments provided with tanks for petroleum—everything exists to facilitate traffic and reduce to a minimum the cost of handling and warehousing. The construction of

the Rhine ports is, however, rather difficult by reason of the variations in the level of the river, which sometimes rises 18 to 22 feet, as most of the basins and floating docks are in free communication with the river. The wharves and talus are of costly construction. Besides, the basins and protected places must be large enough to serve as places of refuge during great floods and the breaking up of ice. These circumstances, as well as the occurrence of very low water, prevent or at least seriously hinder navigation on an average during thirty-seven days per year.

THE ELBE.

Interior navigation is also thoroughly organized on the Elbe, which, together with its tributary, the Moldau, forms to-day a navigable way of 483 miles. Since the completion of the task of rectification the Elbe contributes greatly to the prosperity of the port of Hamburg. At low water the swiftness of the current varies from 1½ to 7 feet per second, and increases to 10 to 11½ feet per second at high navigable water. Even in this latter case the draft of boats can not exceed 4 feet 6 inches, while at low water the possible draft is reduced to 21 inches on the Austrian portion, and does not amount to more than 31½ inches between Magdeburg and the junction of the Havel, above Hamburg.

In spite of the unfavorable conditions, the average price of freight per ton per mile is only $0.00388 upstream and $0.00291 downstream. The boats in use are as much as 197 to 230 feet in length and 28 to 32¾ feet in width, with a capacity of 15,900 to 26,500 cubic feet. Traction is supplied by means of chains from the banks or by steam tugs. Steamboats, known as "Express transports," carry 150 to 200 tons of merchandise and tow a barge of 200 to 250 tons. They cover the distance of 392 miles between the Austrian frontier and Hamburg in three days; in ascending the stream, they require eight or nine days. The rectified Oder and the canal uniting the Oder and the Elbe, which is 143 miles in length, with 25 locks, and follows partially the course of the Spree, constitute beautiful navigable ways in spite of their shallow draft. The lock of Mühlendamm, 377 feet in length and 31½ feet in width, was opened last year. Its completion brought to a conclusion the improvements in the Berlin section, for which the municipality contributed nearly $2,000,000. Boats of 500 tons can now circulate between the Elbe, the Spree, and the Oder.

THE NEW PRUSSIAN CANALS.

Besides the rivers and canals of the March, of which we have just spoken, and the North Sea and Baltic Canal, recently opened, North Germany does not possess any artificial navigable way of importance. As other countries have done, Prussia has presumed upon the economic value of railways. It has been found necessary that railways should carry a large car of coal from Westphalia to Bremerhaven for $10.13—which, for distances of 186 to 279 miles, only amounts to $0.0038825 per ton per mile—and it was not until industry was forced to demand rates below the cost of working the railways that the necessity was

recognized of completing the economic system of the country by the establishment of a well-arranged series of canals. The programme of these works is drawn up and the period of construction has commenced. We are accustomed to see the Germans, after they have adopted a programme, bring to its execution a thoroughly scientific spirit, combined with perseverance and real patriotism. Apt to profit from the experience of others, they know how to give to their creations a remarkable degree of perfection and common sense. The examples which they have furnished in this respect in the organization of their great industries, in the management of their ports, in the creation of their powerful merchant marine, are once more displayed in the construction of a system of navigable ways, recognized as necessary to the industrial and economical expansion of their Empire.

This programme aims principally to connect with each other the great natural arteries of the Rhine, the Weser, and the Elbe. In the beginning, it suffices to open an economic navigable route between the industrial regions of Westphalia and the German ports of the North Sea by the construction of a canal from Dortmund to Emshafen, a project now under full headway.

THE DORTMUND-EMSHAFEN CANAL.

The distance from Dortmund to Emshafen will be 158½ miles. Strictly speaking, the canal extends only from Dortmund to Meppen. From Meppen to Emden the course of the Ems is to be canalized for this purpose. The canal will have a width of 98½ feet at the water level and 59 feet at a depth of 8⅓ feet below the level. In the excavated sections the bed is provisorily fixed at this depth of 8⅓ feet under the water line, but in the embanked sections the cunette is deeper; the bed is 11½ feet under the water level, and even there a width of 46 feet is maintained. The available dimensions of the locks are: Length, 240 feet; width, 28 feet 2 inches. The miters are placed at a depth of 9 feet 10 inches under the water level. With this depth the canal will be practicable for boats carrying 600 tons, and if later it should be deepened so as to employ the entire capacity of the locks, it will receive boats of 700 to 800 tons.

The difference in level between the canal at Dortmund and the North Sea at Emden is 228 feet. This fall is overcome to the extent of 81 feet by a plunge elevator of the Gruson system, established 10 miles from Dortmund, and by nineteen sluice locks scattered throughout the entire length of the canal. These locks will all be provided with hydraulic-pressure operating gear, which will considerably hasten the operation of gates and sluices.

THE DORTMUND-RHINE CANAL.

The canal from Dortmund to the Ems, which a branch prolongs to Herne, is to be continued to the Rhine in such a manner as to connect Ruhrort and Duisburg with Emshafen. At Bevergern, situated

almost halfway between Ruhrort and Emshafen, the great central canal diverges. This will extend to Magdeburg and will establish the junction between the Rhine, Weser, and Elbe.

It is proposed to commence very soon the section from Herne to the Rhine. The distance is only 25 miles, but in this all the difficulties are accumulated. The section passes through the busiest industrial region of Westphalia, and lively rivalries have developed among the great metallurgic and coal companies respecting its route. This latter is rendered most difficult by reason of the declivity of the country, as well as by the permeability of the ground in the zone of the mining concessions.

In order to pass from the Rhine to the summit-level pond, whose water level is 183½ feet above the North Sea, there have been constructed two locks of 16⅓ feet fall, and two Gruson plunge elevators, with a fall of 32⅚ and 46 feet respectively. The section of the canal and the constructive works will have the same dimensions as in the canal from Dortmund to the Ems. The industries of Westphalia are still, however, urging upon the Government to enlarge these dimensions so as to permit the passage of the large Rhine boats. They ask that the locks may be 279 feet in length and 34½ feet in width. The expense of construction of this section of the canal is estimated at $10,000,000.

THE RHINE-WESER-ELBE CANAL.

The central canal, as we have said, diverges midway from the Ruhrort-Emshafen Canal. It will have a length of 224 miles between Bevergern and Magdeburg. This canal is destined not only to have an important transit trade, but also to serve a very large local traffic between Osnabrück, Minden, Hanover, Peine, Brunswick, and Magdeburg. According to the present plan of construction, there will be only four locks and one elevator. The cities mentioned which are not immediately on the main canal will be connected by branches. These will be extended to Osnabrück, Hildesheim, Peine, and Brunswick. The dimensions of the locks and the constructive works will be the same as in the Dortmund-Ems Canal. All known improvements and appliances will be installed to expedite navigation and facilitate traffic. The expense is calculated at $3,475,000.

SOUTH GERMANY AND ALSACE-LORRAINE.

In South Germany and Alsace-Lorraine efforts are likewise being made to develop the means of economical water transportation. The canalization of the Main was finished in 1888 as far as Frankfort, over a distance of 22 miles. The draft, previously only 2¾ feet, has been increased to 8 feet 2½ inches. The locks constructed in 1886, with a length of 279 feet and a width of 34½ feet, have been lengthened. They are now 804 feet long. The expense of canalization, supported

by the Government, amounts to $2,000,000, while the city of Frankfort has expended $1,640,000 for the preparation and outfitting of its port. The traffic, which in 1886, the year of the inauguration of the port, was 156,000 tons, had in 1891 increased to 577,000 tons.

Much is said of the canalization of the Moselle, which is the principal tributary of the Rhine. Canalized already above Metz, it would be transformed in its lower portion—180 miles in length—into a beautiful, practicable waterway, navigable for large Rhine boats. The proposed locks would have a length of 279 feet, a width of 32⅔ feet, and a draft of 8 feet 2 inches. The expense is estimated at $3,570,000, but appears small in comparison with the economic results which are expected. On the other hand, an improvement in the navigability of the Rhine itself above Spire up to Strasburg will probably be accomplished in a short time. The canals of Alsace Lorraine will then be placed in direct communication with the great navigation of the Rhine. These canals, 269 miles in length, have not undergone any modification since 1870. By its insufficiency the waterway system of Alsace-Lorraine formed a gap among the French canals. This need the German Government has undertaken to fill. It may be expected that within three years the Alsace-Lorraine canals will have the usual dimensions and constructive works of French canals, so that they will be practicable in their entirety for large inland boats.

NORTH SEA AND BALTIC CANAL.

Any description of this important waterway would be superfluous here,[1] as all its details have so lately been described in popular and technical journals upon the occasion of its inauguration in June last, that its general features are familiar to the public.

---

[1] A brief description has already been given in this series of reports under the heading "Germany."

Mr. Jackson, Secretary of the United States Embassy at Berlin, in a dispatch dated July 18, states that the customs regulations for the canal, officially named the Kaiser Wilhelm Canal, have been agreed upon by the federal council. He adds: The semiofficial newspapers state that according to these regulations neither articles which are customs free, if in unbroken packages, nor those on which duty is to be paid may be discharged or loaded on board, except at such places as are designated as landing places, without special permission from the customs authorities. A ship going from a foreign port, or from a port of the lower Elbe, to the sea may pass through the canal without any customs inspections, if in charge of a pilot, or if the boat by which she is being towed has a pilot on board, if she make the necessary customs declaration and carries during the trip, which must be without interruption, a designated customs signal. Steamers in charge of pilots, which are to pass through the whole canal without stopping, need not make a declaration if they carry the customs signal. In such cases the inspection of vessels bound for Kiel or Neumühlen takes place at Holtenau. The pilots of ships leaving the canal at Brunsbüttel may not leave the ships until the Elbe pilots come on board. Ships carrying the customs signal must continue their voyage without unnecessary delay and without altering their cargo, and must refrain from any unauthorized communication with the shore or with other ships, except with regard to sending telegrams, or where it is necessary

BELGIUM.

The geographical and economic resemblances which exist between Belgium, Holland, and France are too great not to have occasioned the same needs and the same methods of transportation. Belgium is accordingly liberally provided with navigable ways.

The length of the Belgian system measures 1,229 miles, of which 730 miles are navigable for boats of 300 tons. In France there are 2,555 miles of canals of this class. The greater proportion of Belgian canals is, however, old, and the period of great works may be considered as closed. The canals from Brussels to Willebroeck, from Louvain to the Rupel, from Ghent to Terneuzen, from Ghent to Bruges, from Brussels to Charleroi, and from Maestricht to Bois-le-duc, the canalized Sambre, the greater part of the coal canals, and numerous canals of minor importance were constructed before 1830.

THE MEUSE.

The most important work executed since 1830 has been the canalization of the Meuse. From the cannon foundry below Liege to the French frontier the distance is 70 miles, and the minimum draft obtained is 6 feet 10½ inches. The section from Liege to Namur, executed from 1853 to 1867, includes eight locks of 186 feet in available length and 29 feet 6 inches in width, as well as three large locks like those of the section between Namur and the French frontier. This latter section was finished in 1880, and comprises nine locks of 328 feet in available length and 39⅓ feet in width. The entire work cost nearly $5,000,000. Large boats frequenting the Meuse have a tonnage of 2,500 to 2,800 cubic feet.

THE MEUSE-SCHELDT CANAL.

Supplementary to the canalized Meuse, there was constructed in 1860 the canal from the junction of the Meuse to the Scheldt, with a branch to Bocholt on the canal already existing between Liege, Maestricht, and Bois le Duc. The canal from Bocholt to Antwerp is 53½ miles in length, with a draft of 6 feet 10½ inches and a width of 32¾ feet on the bottom. The locks, numbering seventeen, have a length of 164 feet and a breadth of 23 feet. The maximum tonnage of boats which frequent this canal is 300 to 382 tons.

---

to comply with the customs regulations. If an accident makes a violation of this rule necessary, notice should be given at the nearest customs station as soon as possible. The supervision of the commerce of the canal will be exercised by officers on board of revenue cutters, who are authorized to hail ships, to board them, to inspect their papers, and to search the ships. The main object of this supervision is to see that no unauthorized communication takes place with other vessels or with the land. Captains and crews are required to obey the instructions of the customs officers and to aid them in the performance of their duty. German war vessels and transports and foreign war vessels are not included within these provisions, no customs control being exercised over them.

THE CHARLEROI-BRUSSELS CANAL.

Among present enterprises, we should mention the enlarging of the canal from Charleroi to Brussels and the construction of the Central Canal. Commenced in 1875 and in 1882, respectively, they are progressing with remarkable slowness. The Charleroi-Brussels Canal measures in length 45 miles, of which 15 miles, from Charleroi to Seneffe, have been enlarged to the width of 34½ feet on the bottom and provided with twelve new locks of the length of 127 feet and the width of 16¾ feet. The 30 miles separating Seneffe from Brussels are still to be completed. Forty-three locks exist in this portion. These locks, of antiquated pattern, measure only 74 feet in length, 8⅔ feet in width, and 6½ feet in depth. The boats, called "Charleroi buckets," which can pass, carry only 70 tons.

THE CENTRAL CANAL.

The Central Canal, whose economic interest has considerably lessened, descends from Houdeng, at the end of a branch of the Charleroi-Brussels Canal, to Mons. Its total length is only 13 miles. It is now being constructed with a width at the bottom of 34½ feet and a draft of 6½ feet. It will later be deepened by 1¼ feet. The difference in level between Houdeng and Mons is 293½ feet. The first section of the canal already completed from Mons to Obourg overcomes within 8 miles a difference of level of 76¼ feet by means of one lock of 7⅓ feet in fall and five other locks of 13¾ feet in fall each. These locks have an available length of 133 feet and a width of 16¾ feet. They are provided with all possible appliances. The second section, from Obourg to Houdeng, passes over coal fields, and must, within a distance of less than 5 miles, suffer a difference in level of 217 feet. To effect this purpose, there have been constructed four elevators fitted out with hydraulic pistons, the first three for a fall of 55½ feet and the fourth at Houdeng, which is completed, for a fall of 50½ feet. The Houdeng elevator is one of the most remarkable productions of human industry.

RECENT WORKS.

Some works have been recently executed upon the Scheldt and the Meuse. The dams heretofore existing above Ghent have been replaced by sluice locks 137 feet in length and 18⅔ feet in width. At the same time the course of the river has been straightened. The work of regularization has likewise been pursued below Ghent, where the river is subject to the influence of the tide. While formerly the section of the river under water, when flowing at its full level, was 721 square feet, and the grade 6.96 inches to the mile, this section now measures 1,216 square feet, and the grade per mile is 9.29 inches.

Nearly $600,000 had been spent upon the Meuse to straighten the bed in passing and below Namur. Two new locks have also just been built below that city, 328 feet in length, in place of their predecessors, which were only 184 feet long.

RAILWAYS V. WATERWAYS.

It is interesting to know how traffic is divided between railroads and navigable ways. In an address relative to the results of the operation of railways, delivered by Mr. Amiot at the Railway Congress at St. Petersburg in 1892, we find that the mile tonnage of merchandise transported by slow freight on the Belgian State railways in 1889 was 1,177,752,607 mile-tons. The amount of the corresponding receipts was $16,343,519.08; the average cost of transportation of 1 ton over 1 mile being $0.0139.

While there is no means of verification by official statistics, the total mile-tonnage of all the railways in Belgium may be reasonably estimated at 1,491,294,569.

During the same year the movement of transports upon Belgian navigable ways amounted to 361,017,561 mileage tons. It may, then, be stated that the total of water transportation in Belgium amounts to about 25 per cent of the total railway transportation.

When it is considered that the price of carriage by the State railways amounts to $0.0139 per ton for the mile, while by boat it is only $0.0046, it is surprising that the proportion of water freights is not more important.

COMPARISON WITH NEIGHBORING COUNTRIES.

Compared with the condition of economic carriage in Holland, the Belgian situation is not favorable, for in the first-named country, much the larger share of freights is transported by water. The same is true of Rhenish Prussia and Westphalia.

The Belgian situation resembles more the condition of France. Railway transportation in Belgium is slightly cheaper than in France. In the first-named country it is $0.0139 per ton per mile, while in the latter it amounts to $0.0149 for the same quantity and distance. On the other hand, water transportation in France is equal to 35 per cent of the total railway carriage, while the proportion in Belgium is only 25 per cent.

The Belgian inferiority in respect to economic water transportation is the more striking since the country is comparatively much more industrial and its system of navigable ways is, proportionally, more extensive. This situation is complicated also by two other reasons—the feeble vitality of Belgian shipping and the high rate of freight. The total traffic on Belgian waterways increased from 323,113,823 mile-tons in 1881 to 387,115,215 mile-tons in 1891, while in France it

increased from 1,247,095,082 mile-tons in 1881 to 2,117,016,914 mile-tons in 1891, or an increase during this period of 20 per cent in Belgium and 70 per cent in France.

The following table gives an idea of the price of freights by water. It indicates the price of coal transportation in Belgium and France from the mine to the seaport:

From—	To—	Distance.	Average rate per ton.	Rate per mile per ton.
	Belgian points.			
		Miles.		
Charleroi	Antwerp	75.8	$0.5404	$0.0069
	Bruges	141.25	.8511	.0062
	Ghent	111.25	.6967	.0062
	Termonde	87	.6350	.0073
Liege	Antwerp	96.3	.4536	.0047
	Ghent	149.75	.7238	.0048
Mons	Antwerp	95	.5160	.0054
	Bruges	115	.5867	.0059
	Ghent	85	.4844	.0057
	French points.			
Anzin	Dunkirk	116.2	.3185	.0027
	Calais	116.8	.3590	.0030
	Rouen	273.4	.0943	.0040
Lens	Dunkirk	77	.2046	.0026
	Calais	77.6	.2046	.0026
	Rouen	294	1.1387	.0039

CONDITION OF BELGIAN SHIPPING.

We have observed that during the period 1881–1891 Belgian water traffic increased 20 per cent; but let us examine how this occurred. If we consider the three principal rivers connecting with France we find their traffic increased as follows:

River.	1881.	1891.
	Mile-tons.	*Mile-tons.*
Meuse	15,657,039	42,690,705
Sambre	19,089,650	38,837,386
Lys	8,793,726	19,945,594

A total increase of 57,933,270 mile-tons.

The amount of merchandise which crossed the frontier by these rivers was:

Point.	1881.	1891.
	Tons.	*Tons.*
Agimont, on the Meuse	128,157	575,234
Sobre, on the Sambre	440,851	883,590
Comines, on the Lys	222,276	396,233

Being a total increase of 1,063,765 tons.

We may, therefore, conclude that the increase in the total of Belgian water traffic was limited to a few water courses, and was due chiefly to a proportional increase of traffic on the French canals.

The Scheldt also shows a considerable increase of traffic with Holland and Germany; so that the increase of traffic, strictly speaking, on the interior waterways of Belgium has been very slight.

On all the canals of the two Flanders, the Upper Scheldt, Brussels-Rupel Canal, and the Maestricht-Bois le Duc Canal, the increase has been insignificant. The progressive movement was more accentuated on the Antwerp-Bocholt, Liege-Maestricht, Blaton-Ath, and Ath-Termonde canals. On the other hand, a decrease occurred on the Mons-Conde, Pommerœul-Antoing, and Brussels-Charleroi canals, as well as on the Rupel.

MOVEMENT OF GOODS IN TRANSIT.

The following table indicates the quantity of merchandise imported, exported, and in transit through Belgium during the past five years:

Description.	1889.	1890.	1891.	1892.	1893.
Imported	$300,308,000.00	$322,696,000.00	$347,207,000.00	$296,448,000.00	$303,975,000.00
Exported	281,394,000.00	277,341,000.00	293,167,000.00	264,217,000.00	261,515,000.00
Merchandise in transit	299,922,000.00	291,623,000.00	256,304,000.00	245,882,000.00	238,162,000.00
Share per inhabitant:					
Imported	49.22	52.50	47.09	56.16	49.02
Exported	46.12	45.16	47.86	47.29	42.27
Merchandise in transit	49.22	47.48	41.69	41.30	38.99

The figures for goods in transit indicate a continual decrease, amounting in five years to 20 per cent. It certainly proves that foreign merchandise is finding more advantageous routes for reaching its destination.

RAILWAY TARIFFS.

By its geographical situation, Belgium is destined to carry on a considerable railway traffic. A glance at the following table will suffice to show the advantageous natural position of Antwerp as a seaport. The distances of the principal continental ports from the three industrial and commercial centers of Switzerland, Alsace-Lorraine, and Germany, is therein given. From this comparison Antwerp appears to be the nearest port.

Distances in miles.

From—	To—						
	Antwerp.	Havre.	Dunkirk.	Rotterdam.	Amsterdam.	Bremen.	Hamburg.
Basle	418	470	450	483	504	500	540
Mulhouse	358	449	431	463	483	479	519
Mannheim	289	479	402	330	350	346	386

Ten years ago the railway tariffs were also in favor of Antwerp, as we learn from examining the following figures:

Price of transportation per ton (2,205 pounds) according to tariff in force in 1882.

To—	From—									
	Antwerp.		Dunkirk.		Rotterdam.		Bremen.		Hamburg.	
	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.
Basle:		*Cents.*		*Cents.*		*Cents.*		*Cents.*		*Cents.*
Cereals	$4.61	1.10	$5.09	1.13	$5.35	1.11	.....	.....	.....	.....
Raw cotton	5.52	1.32	9.13	2.03	5.84	1.21	$6.80	1.36	$7.28	1.35
Raw wool	5.86	1.40	12.10	2.69	6.49	1.34	.....	.....	.....	.....
Pig iron	3.17	.76	5.09	1.13	4.10	.85	.....	.....	.....	.....
Mulhouse:										
Cereals	.....	.....	5.09	1.18	.....	.....	.....	.....	.....	.....
Raw cotton	5.26	1.47	9.13	2.12	.....	.....	6.80	1.42	7.28	1.40
Raw wool	.....	.....	12.09	2.80	.....	.....	.....	.....	.....	.....
Pig iron	.....	.....	5.00	1.16	.....	.....	.....	.....	.....	.....
Mannheim:										
Cereals	4.00	1.39	6.26	1.55	.....	.....	6.25	1.81	6.98	1.80
Raw cotton	4.00	1.39	9.70	2.40	.....	.....	6.25	1.81	6.98	1.80
Raw wool	4.94	1.71	11.84	2.94	.....	.....	6.25	1.81	6.98	1.80
Pig iron	2.78	.96	4.55	1.13	.....	.....	3.26	.94	3.60	.93

To-day, however, this situation does not exist, as is seen from the following table of freight rates:

Price of transportation per ton (2,205 pounds) according to existing tariffs.

To—	From—									
	Antwerp.		Dunkirk.		Rotterdam.		Bremerhaven.		Hamburg.	
	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.	Rate per ton.	Rate per ton per mile.
Basle:		*Cents.*		*Cents.*		*Cents.*		*Cents.*		*Cents.*
Cereals	$4.46	1.07	$4.84	1.08	$4.78	0.99	$9.36	.....	$9.43	1.75
Raw cotton	4.67	1.12	4.87	1.08	5.03	1.04	.....	.....	.....	.....
Raw wool	5.86	1.40	6.24	1.39	.....	.....	.....	.....	.....	.....
Mulhouse:										
Cereals	.....	.....	.....	.....	.....	.....	9.24	.....	.....	.....
Raw cotton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Raw wool	5.53	1.55	5.42	1.26	.....	.....	9.24	.....	.....	.....
Pig iron	.....	.....	.....	.....	.....	.....	.....	.....	7.41	1.43
Frankfort on the Main:										
Cereals	4.22	1.55	.....	.....	4.19	1.40	5.84	.....	5.83	.....
Raw cotton	3.77	1.41	.....	.....	4.19	1.40	.....	.....	.....	.....
Raw wool	.....	.....	.....	.....	.....	.....	5.84	.....	5.83	.....
Pig iron	.....	.....	.....	.....	.....	.....	4.72	.....	4.67	.....

Antwerp, it will be seen, has lost its advantages by reason of the greater expense of reaching it. For Westphalia and Rhenish Prussia, Rotterdam and Amsterdam are now the most economical routes, while for eastern France, Alsace-Lorraine, and Switzerland, Dunkirk and Havre offer the best rates. Notwithstanding the greater distance to be traversed, the expense of carriage is less than over the shorter route via Antwerp. In the present situation of European railways it is impossible that Antwerp should recover its lost ground, for any reduc-

tion in freights by Belgian railways would be met by a corresponding fall in the rates of its competitors, so that the latter would always have the advantage.

BENEFIT OF CANALS.

Railway tariffs are badly adapted to commercial fluctuations. In this respect water carriage presents an incomparably greater elasticity. Waterways also create a new competition and often cause railways to reduce their tariffs. It is a happy method of forcing the hands of railway monopolies. Here is the heart of the question. The interest of a country is to have its transportation at the cheapest price possible. In this age especially, when the sharpness of international competition seems not to know any limits, carriage at the lowest price possible is an absolute necessity. Now navigable waterways afford an economical method of transportation par excellence. Not only do they prevent the exaggeration of rates by railways, and, indeed, often produce reductions which permit certain industries to compete in foreign markets, but in many cases they also permit the operation and development of natural riches, mines and quarries, which, by their remote situation, can not incur the comparatively high freights of railways in bringing their products to market. As we shall see, this means of transportation is strongly organized on the European continent.

COMPETITION OF FRENCH PORTS AND CANALS.

As already stated, the competition of Havre, Rouen, and Dunkirk with Antwerp is especially directed upon goods produced in eastern France, Alsace-Lorraine, and Switzerland. The next table indicates the average price of freight for cereals between Antwerp, Dunkirk, and Rouen on the one hand, and Strasburg, Colmar, Mulhouse, Metz, and Nancy on the other:

Average rate for freight per ton (2,205 pounds) per mile.

To—	From—								
	Antwerp.			Dunkirk.			Rouen.		
	Distance.	Rate per ton.	Rate per ton per mile.	Distance.	Rate per ton.	Rate per ton per mile.	Distance.	Rate per ton.	Rate per ton per mile.
	Miles.		*Cents.*	*Miles.*		*Cents.*	*Miles.*		*Cents.*
Strasburg	462	$2.90	0.627	465	$2.70	0.580	486	$2.70	0.555
Colmar	495	3.09	.624	499	2.88	.577	519	2.90	.559
Mulhouse	520	3.09	.594	524	3.03	.578	544	3.03	.557
Metz	396	2.32	.586	403	2.12	.526	418	2.22	.531
Nancy	368	2.12	.576	377	1.93	.512	392	1.93	.492

From this table it will be seen that the rate for Antwerp is in every instance the highest, while the distance is the shortest. The disadvantage is the more important from the fact that in eastern France and

Alsace-Lorraine water carriage is more usual. For instance, in 1893 the water traffic of Nancy amounted to 178,943 tons, chiefly distributed among three navigation companies. Such companies exist in almost every town of that district. Another innovation is the organization of regular steamboat services. There are at present at least 30 steamers navigating the canals of eastern and northern France, and they transport merchandise with the swiftness and regularity of the railroad at a third less expense.

Antwerp still has a slight advantage over Dunkirk in a part of eastern France, especially in the Franch Ardennes. The project of a canal from the Scheldt to the Meuse, to be completed by the canalization of the Chiers from Sedan to Montmedy and Longwy, is, however, a serious menace. By the present route the distances which separate Dunkirk from Mezieres and Nancy are, respectively, 283 and 377 miles; by the new route they would be reduced to 201½ and 348 miles. From Antwerp, the distance to Mezieres is 210 miles; to Nancy, 368 miles.

Another eventuality will some time further affect the trade of Antwerp. Marseilles is loudly demanding communication with the Rhone by a large canal; the construction, indeed, of a new basin to the north of Marseilles is generally regarded as the beginning of this project. This basin cost $3,475,000; the canal, in length not more than 34 miles, is estimated at $15,000,000. This large cost is due to the fact that there is a tunnel 4½ miles long; in order to facilitate traffic as much as possible, there are to be two summit-level lakes, separated by locks. If the canalized Saone and the Rhone-Rhine Canal can be transformed in a similar manner, the most beautiful and the richest navigable artery of the world will have been constructed from the North Sea to the Mediterranean. The junction between the Saone and the Marne and Seine could, without doubt, be completed and the Rhine-Marne Canal might be transformed, thus affording conditions incomparably better than those of to-day for communication between Havre, Rouen, the Rhone, and the Rhine. The port of Marseilles would then be able to control the greater part of the immense trade of the Mediterranean, the East Indies, western Africa, Australia, and the Far East with the most active industrial portions of central and western Europe. The completion of such a waterway would be a great economic conquest for France.

Recurring to the subject of existing competition between Antwerp and northern French ports, it may be thought that the advantages offered to seagoing vessels by the former counterbalance the superior interior connections of the latter. Let us see.

First, we must remember that, since 1880, France has spent more than $155,000,000 for the improvement of its ports. The price of freight is also to be considered. A natural conclusion to draw between two competing ports is, where the freight is the lower the movement of goods will be the larger.

Consult the following table of statistics for 1893:

Port.	Vessels.		Merchandise.
	Number.	Tonnage.	
			Tons.
Antwerp	8,838	9,476,062	4,975,519
Dunkirk	6,078	3,180,311	2,669,958
Rouen and Havre	19,294	8,397,408	5,445,368
Marseilles	18,863	10,610,719	5,251,648

COMPETITION OF DUTCH PORTS AND WATERWAYS.

Examine similar statistics for 1890 to 1893 of the ports of Antwerp and Rotterdam:

Year and Port.	Vessels.		Cargo.
	Number arriving.	Tonnage.	
Port of Antwerp.			*Tons.*
1890	4,532	4,517,698	3,437,553
1891	4,573	4,760,417	3,752,818
1892	4,404	4,457,843	3,227,431
1893	4,481	4,620,790	3,493,825
Port of Rotterdam.			
1890	4,535	2,918,425	4,227,150
1891	4,467	3,008,778	4,393,596
1892	4,422	3,153,099	4,278,849
1893	4,481	3,614,654	4,936,896

The figures show that the amount of merchandise entered at Rotterdam was considerably in excess of the importations at Antwerp.

During the period 1890 to 1893 the increase at Antwerp was only 56,272 tons, or 1.41 per cent, while at Rotterdam it was 709,746 tons, or 14.4 per cent. To-day's figures are not reassuring, especially when compared with those of fifteen years ago. Antwerp then held first place; some of its present competitors could scarcely be considered.

The following figures, showing the tonnage entering the various ports in 1880, clearly indicate this fact:

	Tons.		Tons.
Antwerp	3,063,825	Rotterdam	1,681,650
Marseilles	2,769,047	Bremen	1,169,466
Hamburg	2,766,806	Dunkirk	825,948
Havre	2,267,806		

CAUSES OF THE DEVELOPMENT OF ROTTERDAM.

Rotterdam is to-day certainly the most formidable competitor of Antwerp. How is it that the amount of merchandise passing through Rotterdam has tripled in fifteen years? Neither the superiority of the port and its appliances nor its moderate charges suffice to account for this growth. The difference in rates is only a few fractions of a cent, which, though something, is very little compared with the difference in interior freight rates. To understand the situation we should know

that the development of traffic at Rotterdam is directly connected with the industrial growth of Westphalia and Rhenish Prussia and the expansion of their commercial relations with countries beyond the seas. Among the imports we find more than 1,000,000 tons of minerals and among the exports more than 2,000,000 tons of coal. Still, Holland neither consumes minerals nor produces coal. But the Dutch have admirably understood how to attract German transit trade. They have constructed at Rotterdam the most powerful apparatus existing in any continental port for the mechanical handling and loading of coal. The cars loaded with coal are successively drawn upon the platform of an Armstrong hydraulic elevator, which lifts them 30 feet above the ground. At this height, the wagon is inclined so that the coal immediately slides upon an inclined plane into the hold of the vessel. In this manner, within one hour, 20 car loads, or 200 tons, of coal can be discharged. The charge is 4 cents per ton, including everything, from the time the car leaves the railway track until it is returned. During 1893, 113,900 tons of coal and coke were handled. A new elevator to lift cars of 25 tons to the height of 40 feet is being constructed.

INFLUENCE OF RHINE NAVIGATION.

But it is the Rhine which has become the principal factor in the prosperity of Rotterdam. To see how closely its maritime traffic is connected with the navigation of this river, let us examine the movement to and from Rhine ports. In a previous table we have already noticed that 4,422 ships of 3,153,099 tons entered the port of Rotterdam in 1892 and 4,481 vessels of 3,614,654 tons in 1893. The amount of merchandise imported was 4,278,849 tons and 4,936,896 tons, respectively, an increase of 658,047 tons. During these two years the traffic between Rhine ports and Rotterdam increased from 2,661,495 tons to 3,290,048 tons of merchandise, an increase of 628,553 tons.

Similar statistics for the port of Antwerp do not exist, but statements of the German custom-house at Emmerich indicate for 1892 a passage of 1,447,016 tons of merchandise between Germany and Belgium, and for 1893, 1,310,033 tons. They likewise show that in 1892, 4,863,853 tons of merchandise passed through Emmerich between Germany and Holland. The amount for 1893 was 5,423,418 tons. There was, therefore, an increase in the traffic between Germany and Holland of 557,565 tons of merchandise, while between Germany and Belgium there was a decrease of 136,983 tons.

How can we explain the unfavorable situation of Belgium? First, by the extremely low rates of freight existing between Rotterdam and the Rhine ports. Frequently the carriage of a ton of mineral does not cost more than $0.00155 per mile. The expense from Antwerp to Ruhrort is at least twice as much per mile. The following table shows the average cost of the transportation of cereals between Antwerp,

Rotterdam, and Amsterdam on the one hand, and the principal markets ot the Rhine on the other:

From—	To—								
	Ruhrort-Duisburg.			Cologne-Deutz.			Mannheim.		
	Distance.	Rate per ton	Rate per ton per mile.	Distance.	Rate per ton.	Rate per ton per mile.	Distance.	Rate per ton.	Rate per ton per mile.
	Miles.		*Cents.*	*Miles.*		*Cents.*	*Miles.*		*Cents.*
Antwerp	203	$0.76	0.374	259	$0.89	0.344	421	$1.21	0.287
Rotterdam	134	.31	.231	191	.41	.214	352	.77	.218
Amsterdam	167	.48	.287	223	.63	.282	385	1.16	.301

Besides the extremely low rates of freight, the Dutch ports have a very important advantage in the superiority and regularity of their steam service. While at Antwerp there is only a single line—foreign, indeed—running to Frankfort and Mannheim, consisting of boats drawn by tugs, there are at Rotterdam and Amsterdam several rapid services with large vessels carrying 600 to 800 tons of goods. These boats require only three to four days to cover the 353 miles between Mannheim and Rotterdam, a time which is scarcely lessened by the railways. Not only do these conditions compete with the Belgian waterways, but even the railroads are beginning to feel the effects. It is not natural to suppose that the merchants and manufacturers of the Rhine region will continue to pay a rate of $3 to $5 per ton by rail to Antwerp when they can ship by regular service to Rotterdam at $1.40 to $1.60 or less per ton. Nor is this competition limited to the few cities and ports situated immediately on the Rhine. Far different. The influence of the ports of Ruhrort and Duisburg extends over Westphalia; that of Dusseldorf and Cologne over Rhenish Prussia; that of Frankfort and Mannheim over Bavaria, Wurtemberg, Baden, Alsace-Lorraine, and Switzerland.

The improvements to be made upon the Rhine-Dortmund Canal, the Moselle, and the upper Rhine to Strasburg will certainly increase the influence of Rotterdam in Westphalia, Alsace-Lorraine, and Switzerland. Let us look a moment at the price of freights. The rate for cereals from Rotterdam to Metz will not exceed $1.15 per ton, and to Nancy $1.35. At present, by the Belgian canals, the rate from Antwerp to Nancy is $2.12. For Strasburg the situation will be the same. And what of the railways? How can they compete with such rates when they ask from Antwerp to Strasburg $4.26 per ton for cereals? For other goods the difference is proportional. Freight by rail between Antwerp and Strasburg is $5.99 per ton, while by Rotterdam and the Rhine it is only $1.93.

In this connection, as a conclusion to our description of Rhine traffic, it may be interesting to note the amount of commerce at some of its

ports. At Frankfort on the Main, for instance, the tonnage increased from 155,956 tons in 1886 to 597,315 tons in 1890. The traffic at other ports of the Rhine in 1891 was:

	Tons.		Tons.
Ruhrort	3,535,607	Ludwigshafen	819,970
Mannheim	2,802,703	Cologne and Deutz	570,983
Duisburg	2,744,622	Mayence	252,508

CONCLUSION.

From this review of the existing conditions of inland navigation in France, Germany, Holland, and Belgium, we have learned how thoroughly the system of interior waterways is organized, especially in Holland and the Rhine district. Belgium, although naturally in a superb situation for controlling the transit traffic between the countries southeast of her and those beyond the seas, finds her position seriously menaced. Rotterdam and Amsterdam on the one hand, Dunkirk, Calais, and Havre on the other, are making strenuous efforts to displace the commerce of Antwerp. Failure to maintain Belgian waterways up to the modern standard is largely responsible for this condition. It is not the intention here to go into the details of proposed remedies; suffice it to say that the subject of improved interior waterways is now being agitated. Measures will doubtless soon be taken to promote the best interests of Belgium. But, aside from the question of improvement, there is one element lacking to the prosperity of inland navigation; that is, want of freedom in the movements of commerce. The canal tollgate still exists in Belgium. It is a relic of history. France abolished it many years ago. It exists only in this country, and here its results are disastrously evident. When the tollgate and its keeper disappear, then Belgium can hope to compete with her neighbors as carrier of the commodities of other nations.

In this résumé, made as brief as possible but unfortunately still too long, the effort has chiefly been to present a clear idea of the methods employed by the chief industrial nations of the Continent to secure economical, safe, regular, and speedy transportation of their products to market, and to bring to themselves in like manner their necessary supplies from other parts of the world. Millions and millions of dollars have been spent and are still being spent by Germany, France, and Holland for this purpose. No sacrifice seems too great for them, and indeed the seaports, as we have seen, are not the only recipients of this bounty. They understand that the heart can not be in good order without healthy veins and arteries. Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp, Dunkirk, Calais, and Havre are centers whence the great arteries of trade and commerce radiate; but every one of these ports depends, in turn, upon the thorough and complete organization of its tributary system of railways, rivers, and canals. Just as these adjuncts are in more or less activity, so is the influence of the

port greater or less; just as they are more or less far-reaching, so is its trade large or small. The same conditions are apparent in our own country, but results are generally facilitated by the good humor of nature, which has almost always, by the evident advantages of situation, pointed out to us our commercial centers. We have seldom developed a great port or a great river and canal system against the apparent disposition of nature, or at least without its generous aid. In this respect, we may, perhaps, still have something to learn; at least a study of European examples will enable us to more confidently oppose the difficulties which may beset us in any such undertaking.

HENRY C. MORRIS,
Consul.

GHENT, *July 25, 1895.*

APPENDIX F.

BRAZIL.[1]

I have been earnestly striving for many months to obtain reliable comprehensive data from which to make satisfactory report on the highways of commerce of Brazil, and I regret to say now that many important facts are unobtainable.

This country is very backward in the matter of publishing promptly statistical information as to commercial affairs. I have, however, appended the tables compiled by Crockatt de Sa, C. E., inspector-general of railways in Brazil. These tables cover the latest statistical information obtainable on the railway systems of this country.

The lengths of lines and gauges are stated in kilometers and meters, respectively, and decimals of the same.

Estimate milreis at 22 cents each, this table being in paper currency.

All railway lines are single track. Physical conditions are generally poor as compared with the roads of the United States. Classification of freight and rates are regulated by the executive branches of the Government, and frequent changes in them are made. All roads owned by the Federal Government are operated by the Government, and generally at a loss. The number of men employed to operate a train is threefold more than in the United States; and while the cost per mile for passenger fare is probably 40 per cent less than the average in the United States, the accommodations are very uncomfortable and the cars generally crowded on the main thoroughfares. There is an urgent necessity for the adoption of sleeping cars. Freight rates are extremely high and the service very tardy and unreliable. For certain branch lines freight is only received by the main lines in this city on certain days of each month, notice of which is given, and as a result the drays carrying freight to the depots here on those days block the neighborhood all the day, and often only succeed in delivering one load of freight each during a day. Instances are not rare when it has required from four to six months to have a shipment of goods delivered by the railroad a distance of 300 miles. Each business firm in this city is forced to keep a freight dispatcher specially employed at the freight depot here to see that goods are promptly and properly forwarded. In many instances this adds an item of expense to a business firm of from $40 to $50 (gold) per month. There is certainly great need of a thorough reform in the operation of Brazilian railways.

---

[1] Received too late for insertion at its proper place.

The lines of railway running from this city to Petropolis (25 miles) and beyond and to the top of the Corcovado Mountain, situated in the outskirts of this city, are operated up and down the mountains by steam engines fitted with cogwheels underneath their centers. The cogs of the wheel catch in the cogs of the rail in center of track. The speed is about 6 miles per hour up and 8 miles down. The elevation is about 2,500 feet in the distance of 6 miles. The service has proved quite satisfactory during past six years. The engines are of Swiss manufacture, and they are operated by native engineers.

I also append a schedule of passenger steamship lines operating between this and foreign ports. There are three regular lines of Brazilian steamers plying between domestic ports.

WM. T. TOWNES,
Consul-General.

RIO DE JANEIRO, *August 22, 1895.*

Railway system of the States (Brazil).

Title.	Termini.	States traversed.	Gauge.	Length of lines.		
				In traffic.	In construction from approved plans.	Total.
			Meter.	*Kiloms.*	*Kiloms.*	*Kiloms.*
Santo Amaro.....	Santa Anna and Bom Jardim.	Bahia.....	1	•36.200	.....	36.200
South of Espirito Santo.	Victoria and Cachoeiro do Itapemirim.	Espirito Santo..	1	.....	161.000	161.000
				36.200	161.000	197.200

The railway system of

Title.	Termini.	Gauge.
		Meters.
Baturité	Fortaleza and Crato	1.00
Mamanguape Branch	Maracanahá and Mamanguape	1.00
Custom-house	City terminus and custom-house	1.00
Sobral	Camocim and Sobral	1.00
Sobral (extension)	Sobral and Cracheús	1.00
Central of Pernambuco	Recife and Pesqueira	1.00
South of Pernambuco	Una and Guaranhuns	1.00
Branch of Glycerio to União	Glycerio and União	1.00
Branch of Timbaúba to Pilar	Timbaúba and Pilar	1.00
Branch of Quarabira to Nova Cruz	Guarabira and Nova Cruz	1.00
Branch of Mulungú to Campina Grande	Mulungú and Campina Grande	1.00
Branch of Angelin to Aguas Bellas	Angelin and Aguas Bellas	1.00
Alagoinhas to Villa Nova da Rainha	Alagoinhas and Villa Nova da Rainha	1.00
Alagoinhas (extension)	Villa Nova da Rainha and Joazeiro, on the River Sao Francisco.	1.00
Branch to Jacú	Alagoinhas and Jacú (branch of Santo Amaro)	1.00
Branch to Feira de Santa Anna	42 kilometers from main line to Feira de Santa Anna.	1.00
Paulo Affonso	Piranhas harbor, on River Sao Francisco and Jatobá.	1.00
Rio do Ouro	Ponta do Cajú and Reprezas do Rio do Ouro	1.00
Branch to Iguassú	Cava and Tinguá	1.00
Branch to Rio do Ouro and Santo Antonio.	Rio do Ouro and Santo Antonio	1.00
Branch to Rio Sao Pedro		1.00
Branch to Penha	Murmuria and Fazenda Grande	.80
Central of Brazil	Capital Federal and Lafayette	1.60
Branch to Gambôa	1 kilometer in the main line and station on the quay of Gamboa.	1.60
Branch to Campinho	Cascadura (15 kilometers in main line) and Campinho	1.60
Branch to Santa Cruz	Sapopemba (21.975 kilometers) and Santa Cruz	1.60
Branch to Macacos	Belem (62 kilometers in main line) and Macacos	1.60
Branch to Porto Novo du Cunha	Entre Rios and Porto Novo do Cunha	1.60
Extension	Lafayette and Pirapora	1.00
Branch to Sao Paulo	Barra do Pirahy (108 kilometers in the main line) and Cachoeira.	1.60
Branch to Sao Paulo (narrow-gauge section).	Cachoeira and Sao Paulo	1.00
Branch to Ouro Preto	Lafayette and Ouro Preto	1.00
Porto Alegre to Uruguayana	River Taquary and Uruguayana	1.00
Branch to Cacequi to Bagé	Cacequi and Bagé	1.00
Branch to Santa Anna do Livramento	Main line near Bagé and Santa Anna do Livramento, Saycan and Santa Anna.	1.00

the Union (Brazil).

Length of lines.					Results of traffic during the financial year 1892.			
In traffic.	In construction from approved plans.	Surveyed.	Proposed.	Total.	Receipts.	Expenses.	Net profits.	Deficit.
Kiloms.	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*Milreis.*	*Milreis.*	*Milreis.*
187.589	202.011	271.189	.....	660.789				
7.141	.....	.....	.....	7.141	548,652	655,575	.....	106,923
2.900	.....	.....	.....	2.900				
128.920	.....	.....	.....	128.920				
.....	87.640	.....	110.000	197.640	82,460	148,614	.....	66,154
89.000	81.011	.....	.....	170.011	400,157	532,817	.....	132,660
146.420	.....	.....	.....	146.420				
.....	47.315	.....	.....	47.315				
.....	10.000	33.000	.....	43.000				
.....	.....	53.157	.....	53.157	372,168	594,017	.....	221,849
.....	.....	59.736	.....	59.736				
.....	.....	36.500	153.500	190.000				
321.993	.....	.....	.....	321.993				
.....	131.060	.....	.....	131.060				
					283,808	774,235	.....	490,427
.....	41.000	.....	.....	41.000				
.....	.....	64.000	.....	64.000				
116.000	.....	.....	.....	116.000	93,886	138,094	.....	44,208
53.211	.....	.....	.....	53.211				
12.141	.....	.....	.....	12.141				
.614	.....	.....	.....	.614	239,304	346,963	.....	107,659
11.441	.....	.....	.....	11.441				
6.436	.....	.....	.....	6.436				
462.290	.....	.....	.....	462.290				
1.123	.....	.....	.....	1.123				
1.524	.....	.....	.....	1.524				
34.090	.....	.....	.....	34.090				
4.929	.....	.....	.....	4.929				
63.764	.....	.....	.....	63.764	19,869,190	17,123,525	2,745,665	.....
147.822	100.000	210.000	.....	547.822				
157.198	.....	.....	.....	157.198				
231.000	.....	.....	.....	231.000				
42.451	.....	.....	.....	42.451				
377.000	254.784	.....	.....	631.784				
.....	205.863	.....	.....	205.863	1,364,617	1,327,828	36,789	.....
.....	.....	.....	330.000	330.000				
2,606.997	1,250.684	727.582	593.500	5,178.763	23,254,242	21,641,672	2,782,454	1,169,880

Private railway

Title.	Termini.	Gauge.	Length of lines.	
			In traffic.	In construction.
		Meters.	*Kiloms.*	*Kiloms.*
Taquary to Estrella	Taguary and Estrella	1.0	.....	.....
Capital Federal to Guaratiba	Capital Federal and Guaratiba	1.0	.....	.....
Sao Matheus to Peçanha	Mouth of Sao Matheus and Peçanha	1.0	.....	.....
Recife to Pacifico	Recife and Valparaiso	.....	.....	.....
Jaguarão	Jaguarão and Serro Chato	1.0	.....	.....
Metropolitana	.....	1.0	.....	3.135
Rio Doce	João Gomes (Palmyra) and Piranga	1.0	.....	174.320
Rio Doce (extension)	Piranga and E. F. Victoria to Peçanha	1.0	.....	.....
Uberaba to Coxim	Uberaba and Coxim	1.0	.....	.....
Diamantina	Porto da Manga and Diamantina	1.0	.....	.....
Branch of Serro	Bandeirinha and Serro	1.0	.....	.....
Extension to Santa Anno dos Ferros.	Serro and Santa Anna dos Ferros	1.0	.....	.....
Extension from Ferros to Itabira	Santa Anna dos Ferros and Itabira	1.0	.....	.....
Cariuhauha	Mouth of Rio Verde and division of Goyaz.	1.0	.....	.....
Jequitinhonha (main line)	Montes Claros and Salto Grande	1.0	.....	.....
Jequitinhonha (branch of Guarutuba).	Heights of Gorut and mouth of Rio Verde in the Sao Francisco.	1.0	.....	.....
Bomfim	Arraial Bomf. and Ponte do Pinho E. F. R. D.	1.0	.....	.....
Turvo	Cidade do Turvo and E. F. Oéste	.....	.....	.....
Campinas to Funil	Campinas and Funil	.60	.....	41.000
Caravellas to Aymorés	Caravellas and Aymorés	1.0	142.400	.....
Aymorés to Theop. Ottoni	Aymorés and Theop. Ottoni	1.0	91.000	142.800
Theoph. Ottoni to Peçanha	Theoph. Ottoni and Peçanha	1.0	.....	.....
Victoria to Peçanha	Victoria and Peçanha	1.0	.....	84.100
Aracajû to Simão Dias	Aracajú and Simão Dias	1.0	.....	.....
Branch of Capella	6 kilometers and Capella	1.0	.....	86.157
Santos to Sao Vicente	Santos and Sao Vicente	1.0	9.000	.....
Santo Amaro	Sao Paulo and Santo Amaro	1.05	19.000	.....
Villa Marianna to Villa Mayrink	Villa Marianna and Villa Mayrink	1.05	2.000	2.000
Branch of Gazometro	Villa Marianna and aterrado do Gazometro.	1.05	6.000	.....
Bananalense	Barra Mansa and Bananal	1.0	29.000	.....
Of Bananal	Saudade and Bananal	1.0	11.000	.....
Bragantina	Campo Limpo and Bragança	1.0	52.000	.....
Cataguazes	Cataguazes and Santo Antonio do Muriahé.	.60	.....	48.180
Alagôas to Paulo Affonso	Cidade Alagôas and E. F. Paulo Affonso.	1.0	.....	121.615
Branch of Palmeira dos Indios	Sapucaia and Palmeira dos Indios	1.0	.....	74.492
Branch of Baixo Sao Francisco	.....	1.0	.....	.....
Tijuca	.....	1.0	.....	11.000
Bragança	Belem and Bragança	1.0	59.000	.....
Peçanha to Araxá	Peçanha and Araxá	1.0	.....	.....
Itapemirim	Cachoeiro do Itapemirim and Alegre	1.0	70.000	.....
Do Quilombo	Porto das Flores and Madre de Deus	1.0	.....	.....
Cruzeiro to Santa Cruz	Cruzeiro and Santa Cruz	1.0	.....	.....
Sao Jeronymo (main line)	Xarqueadas and Sao Jeronymo	1.0	15.440	.....
Sao Jeronymo (extension)	Sao Jeronymo and Passo do Mendonça	1.0	.....	189.000
Sao Jeronymo (branch)	Serraria E. F. Bagé e Uruguay	1.0	.....	.....
Tamandaré to Barra	Tamandaré and Settlement Soccorro	1.0	.....	7.000
Do	Barra Velha and Palmares	1.0	.....	.....
Do	Palmares and Sao Bento	1.0	.....	.....
Marianna	Marrianna and Barra do Caeté	1.0	.....	.....
Cantagallo	Nictheroy and Cachoeira	1.0	73.440	.....
Do	Cachoeira and Macuco	1.1	104.986	.....
Branch of Sumidouro	Mello Barreto and Sumidouro	1.0	34.484	.....
Branch of Sumidouro (extension)	Sumidouro and Conselheiro Paulino	1.0	58.288	.....
Branch of Rio Bonito (or Macahé)	Porto das Caixas and Macahé	1.0	146.499	.....
Branch of Sao Fidelis	Campos and Lucca	1.0	53.324	.....
Carangola	Campos and Santo Antonio de Carangola.	1.0	168.432	.....
Branch of Patrocinio	Junction with Carangola and Poço Fundo.	1.0	33.261	.....
Branch of Itabapoana	Station of Murundú and Santo Eduardo.	1.0	22.263	.....
Santo Eduardo	Santo Eduardo and Cachoeiro	1.0	1.659	89.341
Grão Pará	Mauá and Sao José do Rio Preto	1.0	92.038	.....
Norte	Sao Francisco Xavier and junction	1.0	45.340	.....
Main line (Leopoldina)	Porto Novo and Recreio	1.0	66.835	.....
Do	Recreio and Saude	1.0	302.082	.....
Branch of Pirapetinga	Volta Grande and Pirapetinga	1.0	31.032	.....
Branch of Muriahé	Recreio and Santa Luzia	1.0	149.347	64.724
Subbranch of Sao Paulo	Junction (R. Muriahé) and Sao Paulo	1.0	17.733	.....

companies of Brazil.

Length of lines.		Under Government supervision.				Under the supervision of the States.			
Surveyed.	Proposed.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.
Kiloms.	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*
.....	70.000	.....	.....	.....	.....	70.000	.....	1,600,000	7
9.800	55.000	.....	64.800	.....	.....	.....	.....	.....	.....
.....	200.000	.....	.....	.....	.....	.....	200.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	100.000	.....	.....	.....	.....	.....	100.000	.....	.....
.....	.....	.....	3.135	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	174.320	.....	5,229,600	6
.....	340.000	.....	.....	.....	.....	.....	340.000	.....	.....
95.510	904.490	1,000.000	.....	30,000,000	6	.....	.....	.....	.....
108.760	.....	.....	.....	.....	.....	108.760	.....	3,000,000	7
87.076	.....	.....	.....	.....	.....	87.076	.....	.....	.....
191.900	.....	.....	.....	.....	.....	191.900	.....	3,638,000	6
81.000	.....	.....	.....	.....	.....	.....	81.000	.....	.....
.....	480.000	.....	.....	.....	.....	.....	480.000	.....	.....
.....	620.000	.....	.....	.....	.....	.....	620.000	.....	.....
.....	400.000	.....	.....	.....	.....	.....	400.000	.....	.....
.....	38.000	.....	.....	.....	.....	38.000	.....	950,000	6
.....	80.000	.....	.....	.....	.....	80.000	.....	2,000,000	6
.....	.....	.....	.....	.....	.....	.....	41.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	142.400	.....	.....
.....	.....	.....	.....	.....	.....	233.800	.....	7,000,000	7
242.600	.....	.....	.....	.....	.....	242.600	.....	4,420,000	6
422.518	.....	506.618	.....	15,198,540	6	212.618	.....	4,252,360	6
108.060	.....	108.060	.....	5,826,510	6	.....	.....	.....	.....
.....	.....	86.157	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	9.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	19.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	4.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	6.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	29.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	11.000	.....	.....
.....	.....	.....	.....	.....	.....	52.000	.....	2,320,000	7
.....	.....	.....	.....	.....	.....	48.180	.....	500,000	6
.....	.....	121.615	.....	17,913,210	6	.....	.....	.....	.....
.....	.....	74.492	.....	.....	.....	.....	.....	.....	.....
268.000	133.000	401.000	.....	.....	.....	.....	.....	.....	.....
4.000	.....	.....	15.000	.....	.....	.....	.....	.....	.....
150.000	.....	.....	.....	.....	.....	209.000	.....	5,852,000	7
850.000	.....	850.000	.....	25,500,000	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	70.000	.....	1,200,000	7
.....	204.000	.....	.....	.....	.....	204.000	.....	2,500,000	6
37.000	183.000	.....	220.000	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	15.440	.....	.....
.....	.....	189.000	.....	5,670,000	6	.....	.....	.....	.....
375.000	.....	.....	375.000	.....	.....	.....	.....	.....	.....
90.500	.....	97.500	.....	3,912,000	6	.....	.....	.....	.....
32.900	.....	32.900	.....	.....	.....	.....	.....	.....	.....
.....	150.000	.....	150.000	.....	.....	.....	.....	.....	.....
.....	430.000	.....	.....	.....	.....	430.000	.....	10,000,000	6
.....	.....	.....	73.440	.....	.....	.....	.....	.....	.....
.....	.....	.....	104.986	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	34.484	.....	.....
.....	.....	.....	58.288	.....	.....	.....	.....	.....	.....
.....	.....	.....	146.499	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	53.324	.....	.....
.....	.....	168.432	.....	6,000,000	7	.....	.....	.....	.....
.....	.....	33.261	.....	.....	.....	.....	.....	.....	.....
.....	.....	22.263	.....	.....	.....	.....	.....	.....	.....
.....	.....	91.000	.....	2,730,000	6	.....	.....	.....	.....
.....	.....	.....	92.038	.....	.....	.....	.....	.....	.....
.....	75.000	.....	120.340	.....	.....	.....	.....	.....	.....
.....	.....	.....	66.835	.....	.....	.....	66.835	.....	.....
106.073	.....	.....	302.082	.....	.....	271.187	136.968	7,000,000	7
.....	.....	.....	.....	.....	.....	.....	31.032	.....	.....
236.469	.....	.....	.....	.....	.....	336.242	114.298	8,400,000	7
.....	.....	.....	.....	.....	.....	.....	17.733	.....	.....

Private railway companies

Title.	Termini.	Gange.	Length of lines.	
			In traffic.	In construction.
		Meters.	*Kiloms.*	*Kiloms.*
Subbranch of Paraokena	Itapirussú and Paraokena	1.0	18.000	.....
Subbranch of Leopoldina	Vista Alegre and Leopoldina	1.0	12.284	.....
Subbranch of Serraria	Serraria and Guarany	1.0	109.560	.....
Subbranch of Juiz de Fóra	Juiz de Fóra and Piáu	1.0	58.101	.....
Subbranch of Rio Novo	Rio Novo and Furtado de Campos	1.0	8.460	.....
Junction Line	Guarany and junction	1.0	40.858	.....
Branch of Pomba	Guarany and Pomba	1.0	27.196	.....
Barão de Araruama	Quissamã and Triumpho	1.0	40.300	.....
Barão de Araruama (extension)	Triumpho and Visconde de Imbé	1.0	45.434	48.066
Imbetiba to Campos	Imbetiba and Campos	1.0	96.520	.....
Campos to Sao Sebastião	Campos and Sao Sebastião	1.0	22.972	.....
Santo Antonio de Padua	Lucca and Miracema	1.0	91.002	.....
Branch of Cantagallo	Cordeiros and Portella	1.1	77.413	.....
Madeira to Guaporé	Humaytá to Guaporé and Mamoré	1.0	.....	.....
Maricá	Nictheroy and Maricá	.76	40.000	16.000
Muzambinho (trunk)	Pedra Branca and River Station of Rio Verde.	1.0	.....	.....
Branch of Sao Sebastião do Paraizo.	Station of Onça and Sao Sebastião	1.0	.....	.....
Branch of Sao Sebastião do Paraizo (extension).	Sao Sebastião do Paraiso and Jaguára	1.0	.....	.....
Subbranch of Araxá	Forquilha and Araxá	1.0	.....	.....
Branch of Lavras	Varginha and Lavras	1.0	.....	.....
Branch of Campanha to Poços	Campanha and Poços de Caldas	1.0	.....	.....
Branch of Passos	155 kilometers (of trunk) and Passos	1.0	.....	.....
Tres Corações to River Station of Rio Verde.	Tres Corações and River Station	1.0	57.240	.....
Branch of Campanha	106 kilometers (E. Minas e Rio) and cidade Campanha.	1.0	.....	86.000
Taubaté to Ubatuba	Taubaté and Ubatuba	1.0	.....	171.219
Sitio to Sao João d'El Rey	Sitio and Sao João d'El Rey	.76	99.196	.....
Sao João d'El Rey to Oliveira	Sao João d'El-Rey and Oliveira	.76	172.100	.....
Oliveira to the mouth of the Paraopeba.	Cidade de Oliveira and mouth of Paraopeba.	.76	258.240	71.000
Branch of Lavras	Aureliano Mourão and Lavras	.76	48.660	.....
Branch of Itapecerica	Gonçalues Ferreira and Itapecerica	.76	35.000	.....
Branch of Pitanguy	.....	.76	.....	.....
Barra Mansa to Catalão	Barra Mansa and Catalão	1.0	.....	656.174
Paraopeba	Carandahy and mouth of Paraopeba	1.0	.....	.....
Branch of Congonhas	.....	1.0	.....	.....
Rio das Flores	Commercio and Santa Rosa	1.0	62.000	18.000
Sul Paulista	Itú and Iguape	1.0	.....	.....
Magé to Theresopolis	Piedade and Theresopolis	1.0	.....	.....
União Valenciana	Desengano and Rio Preto	1.10	63.900	.....
Sao Francisco to Blumenau	Sao Francisco and Blumenau	1.0	.....	.....
Blumenau to Estreito	Blumenau and Estreito	1.0	.....	.....
Blumenau to Lages	Blumenau and Lages	1.0	.....	.....
Lages to Lagôa Vermelha	Lages and Lagôa Vermelha	1.0	.....	.....
Lagôa Vermelha to Porto Alegre	Lagôa Vermelha and Porto Alegre	1.0	.....	.....
Lages to Chopim	Lages and mouth of Chopim	1.0	.....	.....
Lagôa Vermelha to Passo Fundo.	Lagôa Vermelha and Passo Fundo	1.0	.....	.....
Corcovado	Larangeiras and Peek of Corcovado	1.0	3.775	.....
Caxias to Sao José das Cajazeiras	Caxias and Sao José das Cajazeiras	1.0	.....	77.300
Caxias to Araguaya	Caxias and River Araguaya	1.0	.....	.....
Pequiry	Lafayette and settlement Pequiry (mun. Queluz).	.....	.....	.....
Central de Macahé	Macahé and Glycerio	1.0	44.000	13.280
Louveira to Itatiba	Louveira and Itatiba	1.0	20.000	.....
E. F. Mar de Hespanha or to Aventureiro.	Stat. Sao Pedro and branch of Sao Antonio Aventureiro.	1.0	.....	.....
Elevated railway	.....	1.0	.....	.....
Mogyana (trunk)	Campinas and Ribeirão Preto	1.0	318.000	.....
Ribeirão Preto to Jaguára	Riberão Preto and Ponte do Jaguára	1.0	193.514	.....
Jaguára to Catalão	Ponte de Jaguára and Catalão	1.0	101.733	200.200
Branch of Amparo	Jaguary and Soccorro	1.0	48.000	.....
Branch of Silveiras	Amparo and Serra Negra	.60	41.000	.....
Branch of Penha	Mogy-mirim and Eleuterio	1.0	47.000	.....
Branch of Espirito Santo do Pinhal.	Mogy-guassú and Espirito Santo do Pinhal.	1.0	37.000	.....
Branch of Caldas	Cascavel and Caldas	1.0	77.080	.....
Branch of Rio Pardo or Mococa	Casa Branca and Canôas	1.0	72.000	.....
Branch of Jatahy	.....	1.0	.....	.....
Branch of Areia Branca	.....	1.0	.....	12.000
Resaca to Santos	Resaca and Santos	1.0	.....	5.000
Ouro Preto to Peçanha	Ouro Preto and Peçanha	1.0	.....	.....
Bambuhy to Patos	Bambuhy and Patos	1.0	.....	.....

of Brazil—Continued.

Length of lines.		Under Government supervision.				Under the supervision of the States.			
Surveyed.	Proposed.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.
Kiloms.	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*
.....	.....	.....	.....	.....	.....	.....	18.000	.....	.....
.....	.....	.....	12.284	.....	.....	.....	12.284	.....	.....
.....	.....	.....	.....	.....	.....	109.560	.....	2,990,912	7
.....	.....	.....	.....	.....	.....	58.101	.....	1,800,000	7
.....	.....	.....	.....	.....	.....	.....	8.460	.....	.....
.....	.....	.....	.....	.....	.....	40.858	.....	2,200,000	7
.....	.....	.....	.....	.....	.....	27.196	.....	.....	.....
.....	.....	.....	40.300	.....	.....	.....	.....	.....	.....
.....	.....	93.500	.....	2,805,000	6	.....	.....	.....	.....
.....	.....	.....	96.520	.....	.....	.....	.....	.....	.....
.....	.....	.....	22.972	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	91.002	.....	.....
.....	.....	.....	.....	.....	.....	.....	77.413	.....	.....
.....	800.000	.....	800.000	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	56.000	.....	450,000	.....
146.800	.....	.....	.....	.....	.....	146.800	.....	3,435,258	6
88.000	.....	.....	.....	.....	.....	88.000	.....	2,128,242	6
.....	110.000	.....	.....	.....	.....	110.000	.....	2,750,000	6
.....	60.000	.....	.....	.....	.....	.....	60.000	.....	.....
.....	96.000	.....	.....	.....	.....	96.000	.....	2,350,000	6
.....	160.000	.....	.....	.....	.....	.....	160.000	.....	.....
94.760	100.000	.....	.....	.....	.....	194.760	.....	4,869,000	6
.....	.....	.....	57.240	.....	.....	.....	.....	.....	.....
.....	.....	86.000	.....	2,509,500	4	.....	.....	.....	.....
.....	.....	171.219	.....	5,136,570	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	99.196	.....	.....
.....	.....	.....	.....	.....	.....	172.100	.....	4,000,000	7
.....	.....	.....	.....	.....	.....	329.240	.....	5,500,000	7
.....	.....	.....	.....	.....	.....	48.660	.....	.....	.....
.....	.....	.....	.....	.....	.....	35.000	.....	.....	.....
.....	9.000	.....	.....	.....	.....	.....	9.000	.....	.....
16.826	367.000	1,040.000	.....	31,200,000	6	.....	.....	.....	.....
.....	470.000	.....	.....	.....	.....	470.000	.....	7,500,000	7
12.600	.....	.....	.....	.....	.....	12.600	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	80.000	.....	.....
366.936	.....	366.936	.....	11,008,080	6	.....	.....	.....	.....
46.000	.....	.....	.....	.....	.....	46.000	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	63.900	.....	.....
125.961	.....	125.961	.....	3,778,830	6	.....	.....	.....	.....
139.000	.....	139.000	.....	4,170,000	6	.....	.....	.....	.....
239.000	.....	239.000	.....	7,170,000	6	.....	.....	.....	.....
182.000	.....	182.000	.....	5,460,000	6	.....	.....	.....	.....
335.580	.....	335.580	.....	10,067,400	6	.....	.....	.....	.....
.....	400.000	400.000	.....	12,000,000	6	.....	.....	.....	.....
145.800	.....	145.800	.....	4,374,000	6	.....	.....	.....	.....
.....	.....	.....	3.775	.....	.....	.....	.....	.....	.....
.....	.....	77.300	.....	2,319,000	6	.....	.....	.....	.....
182.720	567.280	750.000	.....	22,500,000	6	.....	.....	.....	.....
.....	15.000	.....	.....	.....	.....	15.000	.....	375,000	6
.....	.....	57.280	.....	1,718,400	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	20.000	.....	.....
69.700	.....	.....	.....	.....	.....	69.700	.....	2,000,000	7
10.000	.....	.....	.....	.....	.....	.....	318.000	.....	.....
.....	.....	.....	10.000	.....	.....	.....	.....	.....	.....
.....	.....	193.514	.....	6,153,857	6	.....	.....	.....	.....
77.760	.....	379.693	.....	11,390,790	6	.....	.....	.....	.....
18.000	.....	.....	.....	.....	.....	.....	66.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	41.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	47.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	37.000	.....	.....
.....	.....	77.080	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	72.000	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	12.000	.....	.....
220.000	.....	.....	225.000	.....	.....	.....	.....	.....	.....
170.000	247.650	.....	417.650	.....	.....	.....	.....	.....	.....
.....	230.000	.....	.....	.....	.....	230.000	.....	8,000,000	.....

Private railway companies

Title.	Termini.	Gauge.	Length of lines.	
			In traffic.	In construction.
		Meters.	*Kiloms.*	*Kiloms.*
Paulista (trunk)	Jundiahy and Descalvado	1.60	226.000	.....
Limeira to Piracicaba	Limeira and Piracicaba	1.60	.....	.....
Branch of Rio Claro	Cordeiro and Rio Claro	1.60	17.000	.....
Branch of Santa Veridiana	Laranja Azeda and Lage (Santa Veridiana).	1.60	38.000	.....
Rio Claro	Rio Claro and Araraquara	1.0	127.098	.....
Branch of Jahú	Station of Visconde Rio Claro and Jahú	1.0	133.000	.....
Siding to Brotas	.....	1.0	10.000	.....
Branch of Agua Vermelha	Sao Carlos do Pinhal and Santa Eudoxia.	1.0	56.000	7.000
Rio Claro (extension)	Araraquara and Berretos	1.0	96.000	.....
Sao Carlos do Pinhal and Ribeirão Bonito.	Sao Carlos and Rio Bonito	1.0	.....	40.000
Branch of Santa Rita de Passa Quatro.	Porto Ferreira and Santa Rita	.60	27.000	.....
Descalvadense	Descalvado and Aurora	.60	14.000	.....
Jundiahy to Sao Sebastião	Jundiahy and Sao Sebastião	1.60	.....	.....
Maceió to Leopoldina	Maceió and Leopoldina	1.0	.....	.....
Branch of Porto Calvo	61 kilometers and Porto Calvo	1.0	.....	.....
Branch Ferreo Campineiro	Campinas and Cabras	.60	21.000	11.000
Branch of Santa Maria	Cavalcante and Santa Maria	.60	.....	11.000
Branch Ferreo Dumont	Ribeirão Preto and fazenda Arindiúba	.60	23.000	.....
Tram. road Nazareth	Nazareth and Santo Antonio de Jesus	1.0	33.814	.....
Do	Santo Antonio de Jesus and Amargoso	1.0	65.000	.....
Recife to Olinda	Recife and Olinda	1.32	12.000	.....
Cruz Alta to Uruguay	Cruz Alta and Rio Uruguay	1.0	.....	381.520
Uruguay to Iguassú	Rio Uruguay and Porto da União	1.0	.....	.....
Iguassú to Pirahy	Porto da União and Valle Pirahy	1.0	.....	.....
Pirahy to Itararé	Valle do Pirahy and Itararé	1.0	.....	.....
Branch of Ijuhy	Cruz Alta and mouth of Ijuhy Grande	1.0	.....	.....
Branch to mouth of Iguassú	Guarapuava and Iguassú	1.0	.....	.....
Branch of Guarapuava	171.600 kilometers line and Sete Quedas.	1.0	.....	.....
Torres to Porto Alegre	Porto das Torres and Porto Alegre	1.0	.....	.....
Sao Paulo to Villela	Sao Paulo and Villela	1.0	128.000	.....
Villela to Botucatú	Villela and Botucatú	1.0	182.000	.....
Botucatú to Tibajy	Botucatú and Tibagy	1.0	.....	410.700
Branch of Itararé	Tatuhy and Itararé	1.0	.....	306.000
Jundiahy to Itú	Jundiahy and Itú	.96	70.000	.....
Branch of Piracicaba	Itaicy and Piracicaba	.96	92.000	.....
Piracicaba to Sao Pedro	Piracicaba and Sao Pedro	.96	59.000	.....
Junction of sections of the Ituana and Sorocabana.	Victoria and Treze de Maio	1.0	15.000	.....
Branch of Tatuhy	Boituva and Tatuhy	1.0	22.000	.....
Branch of Tiété	Cerquilho and Tiété	1 0	8.000	.....
Itú to Manduzinho	Itú and Manduzinho	1.0	.....	.....
Manduzinho to Santos	Manduzinho and Santos	1.0	.....	13.100
Siding of João Alfredo	.....	.96	18.000	.....
Line of Porto Martins	Porto Martins and Sao Manoel do Paraiso.	.96	41.000	.....
Eleuterio to Soledade (trunk, first section).	River Eleuterio and Soledade	1.0	97.000	174.176
Soledade to Baependy (trunk, second section).	Soledade and Baependy	1.0	22.250	11.050
Baependy to Bom Jardim (trunk, second section).	Baependy and Bom Jardim	1.0	.....	137.808
Bom Jardim to Jacutinga (trunk, second section).	Bom Jardim and Jacutinga	1.0	.....	28.142
Jacutinga to Barra (trunk, second section).	Jacutinga and Barra do Pirahy	1.0	90.000	.....
Barra to Itaguahy (trunk, third section).	Barra do Pirahy and Itaguahy	1.0	20.000	68.911
Itaguahy to Botafogo (trunk, first section).	Itaguahy and Botafogo	1.0	.....	94.240
Branch of Passa Tres (trunk, first section).	Pirahy and Passa Tres	1.0	15.000	.....
Branch of Sao José do Paraiso	.....	1.0	.....	.....
Branch of Alfenas	Pouso Alegre and Alfenas	1.0	.....	.....
Branch of Lavras	Bom Jardin and Lavras	1.0	.....	15.000
Branch of Lambary	6 kilometers of main line and Lambary	1.0	.....	.....
Lambary to Pouso Alegre	Lambary and Pouso Alegre	1.0	.....	.....
Branch of Angra	Itaguahy and Angra dos Reis	1.0	.....	99.100
Montes Claros	Montes Claros and Extrema	1.0	.....	.....
Alcobaça to Praia da Rainha	Alcobaça and Praia da Rainha	1.0	.....	.....
Rezende to Bocaina	Suruhy (E. F. Central) and Formoso	1.0	29.000	.....
Rezende to Bocaina (extension)	Formoso and sources of Mambucaba	1.0	10.000	8.000
Santa Maria to Cruz Alta	Santa Maria and Cruz Alta	1.0	.....	160.400

of Brazil—Continued.

Length of lines.		Under Government supervision.				Under the supervision of the States.			
Surveyed.	Proposed.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.
Kiloms.	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*
.....	.....	.....	.....	.....	.....	.....	226. 000	.....	.....
42. 000	.....	.....	.....	.....	.....	.....	42. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	17. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	38. 000	.....	.....
.....	.....	.....	127. 098	.....	.....	.....	.....	.....	.....
.....	.....	.....	133. 000	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	10. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	63. 000	.....	.....
102. 000	.....	.....	.....	.....	.....	.....	198. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	40. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	27. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	14. 000	.....	.....
.....	280. 000	.....	280. 000	.....	.....	.....	.....	.....	.....
129. 480	.....	129. 480	.....	5, 059, 590	6	.....	.....	.....	.....
39. 173	.....	39. 173	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	32. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	11. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	23. 000	.....	.....
.....	.....	.....	.....	.....	.....	33. 814	.....	1, 250, 000	7
.....	.....	65. 000	.....	1, 950, 000	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	12. 000	.....	500, 000	.....
.....	.....	381. 520	.....	11, 445. 600	6	.....	.....	.....	.....
340. 521	.....	340. 521	.....	10, 215, 630	6	.....	.....	.....	.....
380. 000	.....	380. 000	.....	11, 400, 000	6	.....	.....	.....	.....
214. 000	.....	214. 000	.....	6, 420, 000	6	.....	.....	.....	.....
292. 550	.....	292. 550	.....	8, 776, 500	6	.....	.....	.....	.....
.....	367. 000	367. 000	.....	11, 010, 000	6	.....	.....	.....	.....
150. 000	446. 000	596. 000	.....	17, 882, 600	6	.....	.....	.....	.....
222. 140	.....	222. 140	.....	6, 664, 200	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	128. 000	.....	2, 320, 000	7
.....	.....	.....	.....	.....	.....	.....	182. 000	.....	.....
.....	.....	410. 700	.....	12, 321, 000	6	.....	.....	.....	.....
.....	.....	306. 000	.....	9, 180, 000	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	70. 000	.....	2, 052, 600	7
.....	.....	.....	.....	.....	.....	.....	92. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	59. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	15. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	22. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	8. 000	.....	.....
55. 000	.....	.....	.....	.....	.....	.....	55. 000	.....	.....
186. 900	.....	.....	200. 000	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	18. 000	.....	.....
.....	.....	.....	.....	.....	.....	.....	41. 000	.....	.....
.....	.....	.....	.....	.....	.....	271. 176	.....	10, 000, 000	7
.....	.....	.....	.....	.....	.....	33. 300	.....	700, 000	7
.....	.....	.....	.....	.....	.....	.....	137. 808	.....	.....
.....	.....	.....	.....	.....	.....	28. 142	.....	6, 000, 000	7
.....	.....	.....	.....	.....	.....	90. 000	.....	4, 200, 000	7
.....	.....	.....	.....	.....	.....	.....	88. 911	.....	.....
.....	.....	.....	94. 240	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	15. 000	.....	.....
37. 580	.....	.....	.....	.....	.....	37. 580	.....	.....	.....
188. 100	.....	.....	.....	.....	.....	.....	188. 100	.....	.....
171. 186	.....	.....	.....	.....	.....	186. 186	.....	.....	.....
48. 320	.....	.....	.....	.....	.....	48. 320	.....	.....	.....
92. 394	.....	.....	.....	.....	.....	.....	92. 394	.....	.....
.....	.....	.....	99. 100	.....	.....	.....	.....	.....	.....
150. 696	.....	.....	.....	.....	.....	150. 696	.....	3, 000, 000	7
189. 000	.....	189. 000	.....	5, 670, 000	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	29. 000	400, 000	5
40. 000	.....	.....	.....	.....	.....	18. 000	40. 000	.....	.....
.....	.....	160, 400	.....	4, 812, 000	6	.....	.....	.....	.....

Private railway companies

Title.	Termini.	Gauge.	Length of lines.	
			In traffic.	In construction.
		Meters.	*Kiloms.*	*Kiloms.*
Paraná	Paranaguá and Curityba	1.0	111.000	.....
Curityba to Serrinha	Curityba and Serrinha	1.0	71.845	.....
Branch of Porto Amazonas	Serrinha and Ponta Grossa	1.0	56.654	72.220
Branch of Rio Negro	Serrinha and Rio Negro	1.0	30.000	61.000
Branch of Antonina	Morretes and Antonina	1.0	16.995	.....
Pomba	Pomba and E. F. Oeste de Minas	.....	.....	.....
Villa Nova de Lima	E. F. C. do R. and Villa Nova de Lima	1.0	.....	.....
Rio Pardo	Rio Pardo and the border of Bahia	1.0	.....	.....
Rio Pardo (branch of Montes Claros).	Rio Pardo and Montes Claros	1.0	.....	.....
Rio Pardo (branch of Grão Mogol).	Rio Pardo and Grão Mogol	1.0	.....	.....
Border of Minas to Campanha	Municipio de Jaguary and Campanha	1.0	.....	.....
Sao Paulo de Muriahé	Sao Paulo de Muriahé and Abre Campo.	.....	.....	.....
Ceará Mirim	Natal and Paraiso	1.0	.....	45.590
Ribeirão to Bonito	Ribeirão and Bonito	1.0	22.000	38.700
Belem to Paty, Vassouras etc	.....	1.0	.....	.....
Commercio to Sao Francisco Xavier.	Mangueira and Commercio	1.0	.....	67.232
Nazareth to Crato	Nazareth and Crato	1.0	.....	.....
Pelotas to settlement Sao Lourenço (trunk and stat. Marit.).	Pelotas and margins of Camaquam	1.0	.....	141.552
Cachoeira do Campo	E. F. C. do Brazil and Cachoeira do Campo.	1.0	.....	.....
Ponta Grossa to Corumbá	Ponta Grossa and Nioac	1.0	.....	.....
Pontal to Matto Grosso	Pontal (Sao Paulo) and border of Bolivia.	1.0	.....	.....
Petrolina to Piauhy	Petrolina and shores of Piauhy	1.0	.....	.....
Curvello to Ponta das Aráras	Curvello and Serra das Aráras	1.0	.....	.....
Porto Novo to Rio Pardo	Porto Novo and settlement Rio Pardo	.....	.....	.....
Sapucáhy-mirim to Piucuhy	Sapucahy-mirim and Piucuhy	1.0	.....	.....
Jaguary to Sao José do Paraiso	Jaguary and Sao José do Paraiso	1.0	.....	.....
Santa Rita to Sao José de Toledo and Jaguary.	.....	1.0	.....	.....
Paraty to Iguape	Paraty and Iguape	1.0	.....	.....
Taubaté to Amparo	Taubaté and Amparo	1.0	.....	72.000
Central de Alagôas	Maceió and Imperatriz	1.0	88.000	.....
Branch of Assembléa	35 kilometers and Assembléa	1.0	62.000	.....
Bahia to Alagoinhas	Bahia and Alagoinhas	1.60	123.340	.....
Quarahim to Itaqui	Mouth of Quarahim and Itaqui	1.0	175.500	.....
Quarahim to Itaqui (extension)	Itaqui and Sao Angelo	1.0	.....	356.800
Recife to Caxangá	Recife and Caxangá	1.22	14.600	.....
Branch of Afflictos	.....	1.22	4.000	.....
Branch of Varzea	.....	1.22	9.600	.....
Central da Bahia	Cachoeira and Machado Portella	1.067	268.000	.....
Central da Bahia (extension)	Machado Portella and Rio das Contas	1.067	.....	.....
Branch of Feira de Santa Anna	Cachoeira and Feira de Santa Anna	1.0	45.600	.....
Branch of Orobó	Station of Sao Novo and M. Novo	1.0	.....	.....
Natal to Nova Cruz	Natal and Nova Cruz	1.0	121.000	.....
Branch of junction with Conde d'Eu.	Nova Cruz and Independencia	1.0	.....	21.826
Cabedello to Parahyba	Parahyba and Porto Cabedello	1.0	18.000	.....
Conde d'Eu	Porto da Parahyba and Mulungu	1.0	76.000	.....
Branch of Pilar	31 kilometers and Pilar	1.0	25.000	.....
* Branch of Independencia	Mulungú and Independencia	1.0	22.000	.....
Donna Thereza Christina	Imbitúba and Minas do Tubarão	1.0	111.100	.....
Branch of Laguna	Junction (26 kilometers) and Laguna	1.0	5.240	.....
Recife to Limoeiro	Recife and Limoeiro	1.0	82.976	.....
Branch of Nazareth	Carpina and Nazareth	1.0	13.069	.....
Branch of Nazareth (extension)	Nazareth and Timbaúba	1.0	45.010	.....
Montes Claros to Sao João Baptista.	Montes Claros and Sao João Baptista	1.0	.....	.....
Sao Leopoldo	Porto Alegre and Nova Hamburgo	1.0	42.850	.....
Recife to Palmares	Recife and Palmares	1.60	124.739	.....
Minas and Rio	Cruzeiro and Tres Corações	1.0	170.000	.....
Sao Paulo Railway	Santos and Jundiahy	1.60	139.000	.....
Rio Grande to Bagé	Rio Grande and Bagé	1.0	283.000	.....
Branch of Timbó	Alagoinhas and Timbó	1.0	83.000	.....
Catalão to Palmas	Catalão and Palmas	1.0	.....	.....
Total	.....	.....	8,672.701	5,371.970

of Brazil—Continued.

Length of lines.		Under Government supervision.				Under the supervision of the States.			
Surveyed.	Proposed.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.	Extent with guarantee.	Extent without guarantee.	Guaranteed capital.	Rate.
Kiloms.	*Kiloms.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*	*Kiloms.*	*Kiloms.*	*Milreis.*	*P. ct.*
.....	.....	111.000	.....	11,492.042	7	.....	.....	.....	.....
.....	.....	71.845	.....	2,155,350	6	.....	.....	.....	.....
.....	.....	128.874	.....	3,866,220	6	.....	.....	.....	.....
.....	.....	91.000	.....	2,730,000	6	.....	.....	.....	.....
.....	.....	16.995	.....	509,850	6	.....	.....	.....	.....
.....	130.000	.....	.....	.....	.....	130.000	.....	3,250,000	6
.....	6.000	.....	.....	.....	.....	.....	6.000	.....	.....
.....	190.000	.....	.....	.....	.....	.....	190.000	.....	.....
.....	150.000	.....	.....	.....	.....	.....	150.000	.....	.....
.....	250.000	.....	.....	.....	.....	.....	250.000	.....	.....
.....	220.000	.....	.....	.....	.....	.....	220.000	.....	.....
.....	135.000	.....	.....	.....	.....	135.000	.....	3,375,000	6
.....	.....	45.590	.....	1,367,700	6	.....	.....	.....	.....
.....	.....	60.700	.....	1,821,000	6	.....	.....	.....	.....
206.000	.....	.....	.....	.....	.....	206.000	.....	4,984,000	6
44.000	38.768	.....	150.000	.....	.....	.....	.....	.....	.....
.....	650.000	650.000	.....	19,500,000	6	.....	.....	.....	.....
.....	.....	141.552	.....	4,246,560	6	.....	.....	.....	.....
.....	15.000	.....	.....	.....	.....	15.000	.....	200,000	7
.....	1,400.000	.....	1,400.000	.....	.....	.....	.....	.....	.....
.....	1,800.000	.....	1,800.000	.....	.....	.....	.....	.....	.....
102.100	897.900	1,000.000	.....	30,000,000	6	.....	.....	.....	.....
.....	600.000	.....	.....	.....	.....	.....	600.000	.....	.....
.....	40.000	.....	.....	.....	.....	40.000	.....	1,000,000	6
.....	330.000	.....	.....	.....	.....	.....	330.000	.....	.....
.....	60.000	.....	.....	.....	.....	.....	60.000	.....	.....
.....	80.000	.....	.....	.....	.....	.....	80.000	.....	.....
100.000	350.000	.....	450.000	.....	.....	.....	.....	.....	.....
.....	128.000	.....	200.000	.....	.....	.....	.....	.....	.....
.....	.....	88.000	.....	4,553,000	7	.....	.....	.....	.....
.....	.....	62.000	.....	1,860,000	6	.....	.....	.....	.....
.....	.....	123.340	.....	16,000,000	7	.....	.....	.....	.....
.....	.....	175.500	.....	6,000,000	6	.....	.....	.....	.....
.....	.....	356.800	.....	10,704,000	6	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	14.600	.....	1,277,771	.....
.....	.....	.....	.....	.....	.....	4.000	.....	.....	.....
.....	.....	.....	.....	.....	.....	9.600	.....	.....	.....
.....	.....	268.000	.....	13,000,000	7	.....	.....	.....	.....
193.000	.....	193.000	.....	5,790,000	6	.....	.....	.....	.....
.....	.....	45.600	.....	.....	.....	.....	.....	.....	.....
133.000	.....	133.000	.....	3,990,000	6	.....	.....	.....	.....
.....	.....	121.000	.....	5,496,052	7	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	21.826	.....	.....
.....	.....	18.000	.....	615,758	6	.....	.....	.....	.....
.....	.....	76.000	.....	6,000,000	7	.....	.....	.....	.....
.....	.....	25.000	.....	.....	.....	.....	.....	.....	.....
.....	.....	22.000	.....	.....	.....	.....	.....	.....	.....
.....	.....	111.100	.....	5,609,298	7	.....	.....	.....	.....
.....	.....	5.240	.....	.....	.....	.....	.....	.....	.....
.....	.....	82.976	.....	5,000,000	7	.....	.....	.....	.....
.....	.....	13.069	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	45.010	.....	.....	.....	.....	.....	.....
.....	230.000	.....	.....	.....	.....	.....	230.000	.....	.....
.....	.....	.....	.....	.....	.....	42.850	.....	199,980	7
.....	.....	124.739	.....	11,428,088	5	124.739	.....	7,111,111	2
.....	.....	170.000	.....	15,495,253	7	.....	.....	.....	.....
.....	.....	.....	139.000	.....	.....	.....	.....	.....	.....
.....	.....	283.000	.....	13,521,453	7	.....	.....	.....	.....
.....	.....	83.000	.....	2,650,000	6	.....	.....	.....	.....
.....	800.000	800.000	.....	24,000,000	6	.....	.....	.....	.....
10,028.949	17,688.088	18,433.565	8,595.632	608,720,435	.....	7,244.261	8,206.808	172,028,835	.....

OCEAN LINES.

Lines of ocean steamships plying between Rio de Janerio and foreign ports.

Rio de Janerio to—	Passenger rates. *a*		
	First class.	Second class.	Third class.
Royal Mail Line (English; semimonthly).			
Santos	40 milreis	30 milreis	20 milreis.
Montevideo	£10	£6	£3.
Buenos Ayres	£10	£6	£3.
Bahia	110 milreis	80 milreis	50 milreis.
Maceio	130 milreis	90 milreis	60 milreis.
Pernambuco	150 milreis	100 milreis	70 milreis.
Lisbon	£25 to £30	£16	140 milreis.
Vigo	£26 to £31	£17	150 milreis.
Southampton	£30 to £35	£20	£9.
Antwerp	£32 to £37	£22	£10.
Pacific Mail (semimonthly both ways).			
Montevideo	£10	£5	£3.
Buenos Ayres	£10	£6	£3 10s.
Punta Arenas	£25	£15	£8.
Valparaiso	£40	£20	£12.
Caldera	£40	£20	£13.
Arica	£42	£22	£14.
Mollendo	£42	£22	£14.
Callao	£45	£25	£15.
Bahia	100 milreis	75 milreis	50 milreis.
Pernambuco	150 milreis	100 milreis	70 milreis.
Lisbon	£22 to £25	£12	140 milreis.
Vigo and Linares	£23 to £25	£14	150 milreis.
La Pallice	£22 8s. to £30 1s	£16 15s	£10 2s. 1d.
Liverpool	£24 to £30	£15	£9.
Plymouth	£24 to £30	£15	£9.
London	£25 14s. to £31 12s. 6d.	£16 2s. 6d	£9 12s.
New Zealand Steamship Company (monthly service).			
Teneriffe	£25	£15	£9.
Plymouth	£30	£15	£10.
London	£30	£15	£10.
Northern Line (freight line; semimonthly).			
New York			
Lamport & Holt Line (semimonthly).			
Santos	40 milreis		25 milreis.
Valparaiso *b*			
Victoria	75 milreis		
Bahia	100 milreis		35 milreis.
Pernambuco	120 milreis		45 milreis.
New York	£30		£10.
Liverpool *c*			
New Orleans *c*			
Prince Line (freight).			
New York			
Sloman Line (freight; monthly).			
New York			
La Veloce.			
Genoa	1,300 to 750 francs	550 to 400 francs	60 to 100 francs.
Naples	1,300 to 750 francs	550 to 400 francs	60 to 100 francs.
Navigazione Generale Italiana (no fixed dates).			
Santos	30 milreis		20 milreis.
Genoa	1,000 to 750 francs	550 francs	100 milreis.

a Milreis, paper currency, equals 22 cents; pound sterling equals $4.866; franc equals 19.3 cents.
b As per arrangement,
c No passengers taken for Liverpool or New York.

Lines of ocean steamships plying between Rio de Janerio and foreign ports—Continued.

Rio de Janerio to—	Passenger rates. *a*		
	First class.	Second class.	Third class.
La Ligura Braziliana (no fixed dates).			
Genoa		380 francs	55 francs.
Naples		400 francs	55 francs.
Messageries Maritimes (semi-monthly).			
Montevideo	260 to 160 francs	80 francs	80 milreis.
Buenos Ayres	280 to 180 francs	80 francs	80 milreis.
Bahia	200 to 150 francs	50 francs	35 milreis.
Pernambuco	250 to 187½ francs	70 francs	40 milreis.
Dakar	610 to 445 francs	250 francs	
Lisbon	750 to 500 francs	250 francs	140 milreis.
Bordeaux	855 to 605 francs	255 francs	
Vigo	800 to 550 francs	250 francs	
Corunna	800 to 550 francs	250 francs	205 milreis.
Savill, Sewell de Transports Maritimes à Vapeur (semi-monthly).			
Santos	35 milreis	25 milreis	20 milreis.
Montevideo	150 milreis	100 milreis	60 milreis.
Buenos Ayres			
Bahia	90 milreis	70 milreis	40 milreis.
Marseilles	650 francs	500 francs	60 milreis.
Genoa	650 francs	500 francs	60 milreis.
Naples	650 francs	500 francs	60 milreis.
Barcelona	650 francs	500 francs	80 milreis.
Hamburg-Sud-Americanische (weekly).			
Santos	40 milreis		20 milreis.
Victoria	60 milreis		35 milreis.
Bahia	90 milreis		45 milreis.
Pernambuco	120 milreis		60 milreis.
Lisbon	£25 to £30		120 milreis.
Rotterdam	£25 to £30		150 milreis.
Hamburg	£25 to £30		150 milreis.
Copenhagen			
Hamburg-Sud-Americanische South Brazil Line (tri-monthly).			
Paranagua	60 milreis		30 milreis.
Sao Francisco, Brazil	80 milreis		40 milreis.
Desterro	100 milreis		50 milreis.
Rio Grande	150 milreis		75 milreis.
Porto Alegre			
Hamburg-Sud-Americanische South Brazil Line (no fixed dates).			
Santos	40 milreis		20 milreis.
Rio			
Bahia	90 milreis		45 milreis.
Pernambuco	120 milreis		60 milreis.
Lisbon	£25		120 milreis.
Oporto			
Havre			
Hamburg	£25		150 milreis.
Norddeutscher Lloyds, Bremen (semimonthly).			
Santos	(*b*)	(*b*)	20 milreis.
Bahia	(*b*)	(*b*)	45 milreis.
Lisbon	(*b*)	(*b*)	120 milreis.
Antwerp	(*b*)	(*b*)	150 milreis.
Bremen	(*b*)	(*b*)	150 milreis.

a Milreis, paper currency, equals 22 cents; pound sterling equals $4.866; franc equals 19.3 cents.
b None taken.

INDEX.

[The following index is arranged under eight general heads, viz: (1) Bridges, grades, trestles, tunnels, and viaducts; (2) Canals; (3) Coastwise and intercolonial commerce; (4) Highways; (5) Inland navigation, as distinct from canals; (6) Ocean lines—names of lines and vessels calling at and departing from the several ports, tonnage and horsepower, itinerary, etc.; (7) Railways—history, cost of construction, termini, and main points touched. Under each of these heads, the subjects are arranged geographically, viz: Africa, America, Asia, Australasia, Europe, and Polynesia, the countries being arranged alphabetically under each continent. Subjects which could not be indexed under any of the foregoing heads are alphabetically arranged under "(8) Miscellaneous."]

1. BRIDGES, GRADES, TRESTLES, TUNNELS, AND VIADUCTS.

AMERICA: Page.

Canada—British Columbia (trestle spanning the Niagara Canyon).. 30

South America—

Bolivia (iron bridge over the Cahama River)..... 130

Colombia (iron bridge over the Chagres River)..... 99

Peru (bridges and tunnels on the Peruvian Central Railway)..... 123–125

ASIA:

British Asia—

Ceylon 573, 574

Bridges and tunnels, on the Kaduganawa incline, 573; iron bridges over lagoon and river, 574.

India (bridges)..... 570

China (viaducts and bridges, not railway)..... 612

Dutch India—Java..... 594, 595

Bridges over the Solo and Brantas rivers, 594; viaducts, 595.

Japan (engineering difficulties overcome)..... 615

Turkey in Asia—Syria (heavy grades over the Lebanon Mountains) 526

AUSTRALASIA:

New South Wales (switchbacks on the Blue Mountains)..... 625

EUROPE:

Mont Cenis Tunnel (history of its building)..... 363–367

Germany (railway bridge over the Rhine at Mayence)..... 323

Holland 236, 238

Rhine bridge, Lek bridge, Waal bridge, Maas bridge, 236; bridge over the Merwede, Rhine bridge, Yssel bridge, 238.

Italy (roadbed cut out of the solid rock, and one-half the line runs through tunnels)..... 371, 372

Russia (engineering difficulties, bridges, curves, gradients, etc., on the Great Siberian Railway)..... 412, 414

Spain..... 299, 700–702

Bridges, tunnels, and gradients on the Barcelona-Saragossa Railway, 299; names and length of tunnels on all Spanish railways, 700–702; engineering difficulties encountered, 702.

Sweden (bridges and tunnels on Swedish lines)..... 425

UNITED KINGDOM:

Wales (grades, bridges, and tunnels)..... 201

2. CANALS.

AFRICA: Page.

French Africa—Tunis 440

Madagascar 451

Turkey in Africa—Egypt (Suez Canal, description and trade) 446, 447

AMERICA:

Canada 19–34

Beauharnois, 23; cost of and traffic on Canadian canals, 19, 20; Canal Commission, United States and Canada, 26; Cornwall, 24; Farrans Point, 24, Galops, 24; Lachine, 23; Rapide Plat, 24; Rideau, 34; Sault Ste. Marie, 25; Welland, 24; Williamsburg, 24.

Central America (Nicaragua Canal) 77

Mexico 58–59

American, 58; Chijol, 58; Tempoal, 59.

South America:

Brazil 118

Colombia (Panama) 101

ASIA:

China (Grand Canal) 597

EUROPE:

Austria-Hungary 338

Belgium 334, 716–718

Length of canals, 716; canalization of the Meuse, 716; Meuse-Scheldt Canal, 716 Charleroi-Brussels Canal, 717; Central Canal, 717; recent works, 717; railways *v.* waterways, 718; Belgian canals compared to those of neighboring countries, 718.

France 278, 705–707

Mileage of canals, 705; canalization of the Rhone, 705; improvement of the Rhone, 706; development of canals, 707.

Germany 323, 713, 714

Official list of canals, 323; Baltic and North Sea Canal, 325, 715; Dortmund-Emshaven Canal, 713; Dortmund-Rhine Canal, 713; Rhine-Weser-Elbe Canal, 714; canals of South Germany and Alsace-Lorraine, 714.

Greece 389

Holland 708–710

Canal system, 708; Meerwede Canal, 710.

Interior waterways of northwest Europe 704–728

Benefit of canals, 722; thoroughness of the canal system of northwest Europe, 727.

Norway 423

Russia 394

Sweden 426

United Kingdom—

England 167–177

British canal statistics, 167; Air and Calder, 169; Birmingham and Liverpool, 177; Chester, 177; Ellesmere, 172; Grand Junction, 174; Leeds and Liverpool, 171; Manchester Ship, 171, 175; Montgomeryshire, 172; Regents, 173; Sheffield and Tinsley, 175; Shrewsbury, 172; Shropshire, 171; Surrey, 174.

Ireland 177–179

Ballyconnell, Ballymore, Barrow, 177; Coal Island, 179; Grand, 177, 178; Lagan, 177, 179; Lough Corrib, 177; Lower Bann, 177; Lower Boyne, 177; Newry 177; Royal, 177; Ulster, 177, 179.

Scotland 180–183

Caledonia, 182; Crinan, 183; Forth and Clyde, 181; Monkland, 182; ship canal (proposed), 183; Union, 180.

3. COASTWISE COMMERCE.

AFRICA: Page.

British Africa—Somali Coast 469

AMERICA:

Canada—

British Columbia 29, 30

Pacific Coast Steamship Line; Canadian Pacific Navigation Line, 29; Puget Sound and Alaska Steamship Line; the Comax Line, 30.

New Brunswick 35, 36

International Steamship Line; Bay of Fundy Line, 35; Grand Manon Line, 36.

Prince Edward Island 40

Central America—British Honduras 73

South America—

Argentine Republic 149, 150

Brazil (laws regulating) 112

British Guiana 696

Chile 138

Venezuela 103

West Indies, British—Bermuda 81

ASIA:

British Asia—Straits Settlements 581–583

Lines to adjacent states and colonies, 581; coastwise, 583

China 605

Dutch Asia—Java 593

Spanish Asia—Philippines 620

AUSTRALASIA:

New South Wales (intercolonial) 623

New Zealand 646, 648

Coastwise, 6466; intercolonial, 648.

Victoria 635

EUROPE:

Denmark 241

France 246

Bordeaux 261

Boulogne 268

Havre 259

Marseilles 249, 250

Greece 387

Italy 358

Palermo 375

Norway 421

Russia 393, 408

POLYNESIA:

Fiji Islands (intercolonial) 651

Hawaii (interisland) 656

Tahiti (interisland) 654

4. HIGHWAYS.

AFRICA:

British Africa—

Cape Colony 472

Central Africa 485, 486

Mauritius 460

Sierra Leone 509

Somali Coast (road improvements) 469

AFRICA—Continued. Page.

Madagascar 452

Portuguese Africa—Angola 498, 500

Orange Free State 476

Turkey in Africa—Egypt 447

AMERICA:

Canada—

British Columbia 31

New Brunswick 36

Nova Scotia 38

Central America—

British Honduras 73

Costa Rica 79

Honduras 73

Mexico 67–69

Vera Cruz road; Cuernavaca road; Mexico-Potosi road, 68; San Luis Potosi-Victoria road; Mexico-Acapulco road, 69.

South America:

Bolivia 130

British Guiana 108, 696

Brazil 115

Chile 137

Ecuador 120

Paraguay 140

Uruguay 146

West Indies—

British West Indies 79, 81, 86

Bahamas 79; Bermuda, 81; Jamaica, 86.

Haiti 85

Spanish West Indies—Puerto Rico 86

ASIA:

British Asia 570, 571

Ceylon, 571; India, 570.

China 598, 600, 608

Highways and ancient road building in China, 598, 600, 608.

Japan 612

Korea 617

Maskat 532

Persia 532, 536

Ancient road builders, 532; highways, 536.

Turkey in Asia 517, 526, 530

Asia Minor, 517; Syria, 526; Palestine, 530.

AUSTRALASIA:

New South Wales 627

Victoria 638

EUROPE:

Austria-Hungary 343, 347

Imperial highways, 343; Bohemian macadamized highways, 347.

Denmark 245

France 281

Germany 326, 331

Greece 389

Italy 368

Genoa roads, 372; Palermo roads, 377.

Malta 386

EUROPE—Continued. Page.
Norway 424
Spain 300
Sweden 425
Switzerland 337
United Kingdom—
England 184–186
British highways, 184; Liverpool highways, 185; English middle counties' roads, 186.
Ireland 188, 219
Scotland 187, 214
Wales 202
POLYNESIA:
Fiji Islands 653
Tahiti 654

5. INLAND NAVIGATION.

[Rivers and lakes, as distinct from canals.]

AFRICA:
British Africa—Central Africa 480–488
Shire and Zambesi rivers, and Lakes Nyassa and Tanganyika, 484, 485, 486, 488.
Congo Free State 504–507
The Upper and Lower Congo, 504, 506, 507.
French Africa—Tunis (lake leading to the port of Bizerta) 440
German Africa—Cameroons 491, 492
Sanaga River, 491; Rio del Rey, 492.
Madagascar 451, 452
Portuguese Africa—
Angola (River Quanza) 498
Mozambique (Zambesi and Shire rivers, and Lake Tanganyika) 464
Turkey in Africa—Egypt 445, 446
The Nile, 445, 446.
AMERICA:
Canada (St. Lawrence River and Great Lakes; Ottawa and Richelieu rivers) 20–22
New Brunswick (St. John River) 26
Central America (San Juan River and Lake Nicaragua) 76
Mexico 58–61
Lakes: Chairel (58), Laguna de la Madre, and Terminos (59). Rivers: Armeria (61), Coahuayana (61), Coatzacoalcos (59), Chacala (61), Champoton (61), Colorado (61), Conception (61), El Moraltillo (58), Gonzalez (60), Grihalva (60), La Balsa (61), Mamantel (61), Mayo (61), Mazatlan (61), Mescalupa (60), Panuco (58, 59), Papaloapam (59), Piginto (61), Presas (59), Rio Grande (58), Rio Verde (61), San Juan (59), San Pedro (60, 61), Santiago (61), Soto la Marina (59), Tauchiochapa (60), Tehuantepec (61), Tempoal (59), Tuxpam (59), Usumacinta (60), Yaqui (61).
South America—
Argentine Republic (La Plata, Parana, and Uruguay rivers) 150
Bolivia 133–136
The Amazon, 133, 135; Desaguadero River and Lake Titicaca, 134; Parana and Paraguay rivers, 135; Purus, Madre de Dios, Beni, and Guapore rivers, 136, Paraguay River, 135.
British Guiana (rivers) 107, 696
Brazil 116, 117
Rivers: Amazon, Paraguay, and La Plata, 116; San Francisco and Parana, 117.
Ecuador 120, 121

AMERICA—Continued.
South America—Continued. Page.
Paraguay 139, 142
Rivers: Rio Apa, Paraguay, and Parana, 139, 140. River lines: Platense, Fluviales, and Lloyds, 142.
Uruguay (La Plata: Uruguay to Buenos Ayres) 145
Venezuela 103, 104
Rivers, 103; Lake Maracaibo, 104.
ASIA:
British Asia—Straits Settlements 583
China 597–608
Chinese waterways, rivers, and lakes, ancient and modern, 598, 599, 601, 604; Grand Canal, 597; Imperial Canal, 604; Tientsin to Peking, 608.
Japan 612
Korea (Seoul to Chemulpo) 617
Spanish Asia—Philippines 637
Turkey in Asia—
Asia Minor (the Meander and the Hermus) 517
Bagdad (traffic on the Tigris; English and Ottoman Steamship Companies) 518–521
AUSTRALASIA:
Victoria (the Murray and Yarra rivers) 637
EUROPE:
Austria-Hungary 338–353
The Danube and its tributaries, 338; the Drau, the Theiss, the Save, the Elbe, 339, 347; the Moldau, 347; the Danube in Hungary, 353.
Belgium 235, 716–718
Antwerp-Brussels, 238; the Meuse and the Scheldt, 716, 717; waterways *v.* railways, 718; Belgian waterways as compared with those of neighboring countries, 718; Belgian water traffic, 719.
France 705
Cost and mileage of waterways, 705; the Rhone, 705.
Germany 711–715
The German Rhine, 711; the Elbe, 712; the Main, Moselle, 715.
Holland 708–710
Interior waterways system, 708; the Rhine, Wahl, and Meerwede, 709; development of traffic, 710.
Italy 358, 359
Lakes: Garda and Como, 358; Lugano and Maggiore, 359. The Tiber River, 359.
Norway 423, 424
Lakes: Miosen, Randsfjord, and Nordsjo, 423; Glieren, 424.
Russia 394, 497
Rivers: The Volga and Rama, 394, 395; total interior waterways; the Volga, the Rybinsk, the Kama, the Dniva, the Dniester, the Dnieper, etc., 406, 407.
United Kingdom—
Scotland (the Clyde) 209
Wales (the Severn) 202

6. OCEAN LINES.

[Names of lines and steamers calling and departing from the several places mentioned; tonnage and horse power; itinerary; termini and intermediate ports touched; freight and passenger rates; condition of lines; accommodation; frequency of communication; ownership, etc.]

AFRICA:
British Africa—
Cape Colony (Cape Town) 471
Mauritius (Port Louis) 459
Natal (Port of Durban: Castle Mail Packet Company) 477
Sierra Leone 509

AFRICA—Continued.
French Africa—
Page.
Algeria 431
Tunis 438
German Africa—
Cameroons 491
East Africa 494, 495
Southeast Africa 493
Togoland 490
Kongo Free State 502
Madagascar 453–457
Castle Line, 453; Messageries Maritimes, 453–456; Austrian Lloyd; Havre Peninsular Line, 456.
Morocco 427–430
Portuguese Africa—
Angola (Loanda) 497
Madeira 514, 515
Union Steamship Company, Castle Mail Packet Company, British African Steam Navigation Company, Booth Line, Mersey Steamship Line, Africanish Dampfschiffs-Actien-Gesellschaft, 514; Hamburg-südamericanische Dampfschifffahrts-Gesellschaft, Empreza Nacional de Navegação, and Empreza Insularia de Navegação, 515.
Mozambique 460–462
German East African Line, 460; Union Steamship Company, 461; Castle and Clan Lines, etc, 462.
Tripoli 442, 443
Turkey in Africa—Egypt 450
Zanzibar 470
AMERICA:
Canada—
British Columbia (Canadian Pacific Line; Canadian-Australasian Line; Northern Pacific Line) 28
New Brunswick (Furness Line; West India Line) 35
Newfoundland 38
Nova Scotia 38
Prince Edward Line (Charlottetown) 38, 39
Central America—
British Honduras (Belize: New Orleans and Belize Royal Mail and Central American Steamship Company; New York-Belize Line; Harrison Line) 72
Guatemala (Pacific Mail Steamship Line; New York, Belize and Central American Line) 71
Nicaragua 75
Mexico 66, 67
New York and Cuba Mail, German Imperial Mail, Harrison Line, Mexican Line, Spanish Transatlántica, Compagnie Générale Transatlantique, 65; New York, Mobile and Mexico Line, Gonzales Line, French Commercial Line, Berreteago & Co.'s Line, Pacific Mail Line, Redo Line, Izaguirre & Co.'s Line, Sinaloa and Durango Railway Line, 66; Pacific Coast Line, Morgan Line, Maldonado Line, Royal Mail Packet Company, Hamburg-American Packet Company, etc., 67.
South America—
Argentine Republic (Buenos Ayres) 147–149
Royal Steam Packet Line, Pacific Steam Navigation Line, Lamport & Holt Line, Chargeurs Réunis Line, Messageries Maritimes, General Steam Transportation Line, 147; La Veloce Steam Line, Italian Steam Navigation Line, Imperial North German Lloyd, Bremen and La Plata Line, Hamburg-South American Line, Kosmos Line, Norton Line, Knott's Line, 148; Passage and freight rates, 149.

AMERICA—Continued.
South America—Continued. Page.
British Guiana 106, 697
Brazil (Rio de Janeiro) 108–111
British lines, 108; German lines, 109; Italian, Austrian, French, and Brazilian lines, 110; American lines and tramp steamers, 111; schedule of passenger rates from Rio de Janeiro, 742, 743.
Chile (Valparaiso) 138, 139
South American Steamship Line, Pacific Steam Navigation Line, Gulf Line, 138; Merchants' Line, 139.
Colombia (Panama) 90–97
South American Steamship Line, 90; Pacific Steam Navigation Line, 91; North American Navigation Line, 92; Pacific Mail Line and freight rates, 93–97.
Ecuador (Guayaquil) 118–120
Pacific Steam Navigation Line and the Compañía Sud-América Line, 118; Gulf Line and Hamburg-Pacific Line, 119; French Pacific Line, Pacific Steam Navigation Line, Kosmos Line, and Merchants' Line, 120.
Peru (Callao) 125–128
Uruguay (Montevideo) 144, 145
Royal Mail Line, Pacific Steam Navigation Line, Messageries Maritimes, Chargeurs Réunis, Norddeutscher Lloyd, Navigazione Generale Italiana, La Veloce Line, Hamburg-Südamericanische Line, and Kosmos Line, 144; Hansa Line, Compañía Transatlántica Line, Lloyds Brazilero, and Lamport & Holt Line, 145.
Venezuela (Maracaibo: Red D Line) 103
West Indies—
British West Indies 80, 81, 87
Bahamas, 80; Bermuda, 81; Jamaica, 87.
Haiti 85
Santo Domingo 86
Spanish West Indies (Cuba) 82, 83
United States—
Ocean lines leaving United States ports 661–696
Baltimore (for Germany, Holland, Central America, Mexico, and West Indies) 682–684
Boston (for Great Britain, Belgium, and British Provinces) 684–686
Eastport 687
Los Angeles 694
New Orleans (for Great Britain, France, Holland, and Germany) 689–691
Newport News 688
New York 664–679
For Great Britain, 664; Germany, France, 665; Holland, Belgium, Baltic, Spain, Mediterranean, 666; China, Japan, Africa, South America, 667; Central America, West Indies, Mexico, 668.
Pensacola (for Central America, Mexico, and West Indies) 691
Philadelphia (for Great Britain, Germany, Belgium, Central America, Mexico, and West Indies) 680–682
Port Townsend 693
San Diego 694
San Francisco 691–693
China and Japan, 691; Panama, Honolulu, and Australasia, 692.
Tampa (for West Indies) 691

ASIA:

British— Page.

Ceylon 570, 571

Peninsular and Oriental Line, British India Line, Messageries Maritimes, North German Lloyds, Bibbe Line, Orient Line, 570; Ocean Steamship Line, Henderson's, City, Clan, Glen, and Anchor Lines, Austrian Lloyds, Rubattino Line, Russian Volunteer Fleet, Japanese Line, Asiatic Steamship Line, Deutsche-Australische Line, Hamburg Line, Ceylon Steamship Line, tramp steamships, 571.

India 562–569

Bombay: British India Steam Navigation Line, 562; Anchor and Peninsular and Oriental Lines, 563; Florio-Rubattino, Austrian Lloyds, Hall Line, and Messageries Maritimes, 564; Japan Steamship Company, 565; distances from Bombay, 566, 569.

Calcutta: Peninsular and Oriental Line, 560; Clan Line, Messageries Maritimes, Anchor Line, Asiatic Steam Navigation Line, British India Steam Navigation Line, City Line, Indo-China and Apcar Lines, 561; freights, 562.

Hongkong 608–610

Pacific Mail and Occidental and Oriental Lines, 608; Canadian Pacific and Douglas Steamship Lines, 609; Northern Pacific Steamship and Peninsular and Oriental Steamship Companies, 610.

Straits Settlements 578–583

Messageries Maritimes, 578; Peninsular and Oriental Steamship Line, and Norddeutscher Lloyd and Austrian Lloyd Lines, 580; Compañia Transatlantica, miscellaneous lines, British India Steam Navigation, Koninklijke Paketraart Maatschappij, 581; Ocean Steamship, Apcar, Jardine, and Sarawak, and Singapore Lines, 583.

Dutch India—Java 591–592

Stoomvaart Maatchappy Nederland, Rotterdam Lloyds, Queensland Royal Mail, Peninsular and Oriental, and Messageries Maritimes Lines, 591; routes, 591; condition and equipments and passenger and freight rates, 592.

French Asia (Saigon: Messageries Maritimes) 617

Japan (Kanagawa: Japan Mail, Occidental and Oriental, Canadian Pacific, and Peninsular and Oriental Lines) 615, 616

Korea (Seoul) 617

Maskat (British India Steam Navigation Line) 531

Spanish Asia—Philippine Islands (Manila: Compañía Transatlántica and new opposition line) 619

Turkey in Asia—

Asia Minor (Smyrna: Ocean lines) 517

Palestine (Jaffa: Austrian Lloyds, Messageries Maritimes, Russian Steam Navigation, Khedive, Faber, Bell's Asia Minor, Knott's, and Machaussieh Lines) 527–530

Syria (Beirut) 522–525

Messageries Maritimes, 522; Austrian Lloyds, 523; Compagnie Russe, 524; Khedive Line, 525.

AUSTRALASIA:

New South Wales (Sydney) 621–623

Peninsular and Oriental, Orient, Messageries Maritimes, Norddeutscher Lloyds, German Australian, and China Navigation Lines, 621; Eastern and Australian, Port, Oceanic, Canadian Pacific, White Star, Lund's, and Gibb Lines, 622.

Intercolonal lines: Adelaide Steamship Company, Australian-United States Navigation Company, Huddart-Parker Company, and Union Steamship Company, 623.

New Zealand (Auckland) 639–646

New Zealand Shipping Company, 639–642; Shaw, Savill & Albion Company, 643, 644; Shire Line, 644; Oceanic Line, 645; sailing ships, 646.

AUSTRALASIA—Continued. Page.
Victoria (Melbourne) 627–634
Old and new service, 627–629; Oceanic Steamship Company, 629; Peninsular and Oriental Steam Navigation Company, 630; Orient Steam Navigation Company, 631; Gulf Line, Lund's Line, and Norddeutscher Lloyds, 632; Messageries Maritimes and Anglo-Australian Line, 633; China Navigation Company and Australian and India Lines, 634.

EUROPE:
Belgium (Antwerp) 227–234
Red Star Line, 225; North German Lloyd, 226; Peninsular and Oriental Line, 227; Union Steamship Line, 228; Kosmos Line, 229; Puritan Line and Hamburg Pacific Steamship Line, 230; Prince Line, Hansa Line, and Bossières Bros. Line, 231; Ross Line, White Cross Line, New Orleans Line, Cuban Line, Compagnie Générale Transatlantique, La Flecha Line, West India Steam Navigation Line, Lamport & Holt Line, Royal Mail Steam Packet Line, Antwerp and London-Brazil Line, Macandrews Line, Gellatly, Hankey & Sewell Line, Antwerp-Chile Line, and Atlas Line, 232; Mersey Steamship Line, British India Line, Hansa Line, Hamburg-Calcutta Line, Union Line, China Shippers Mutual Line, Shire Line, Glen Line, Anglo-Australasian Line, and European lines, 233.
Denmark (Copenhagen) 240–244
Thingvalla Line, 240; United Steamship Line, 241; other lines and routes, 242–244.
France—
Total entrances and clearances in French ports 270
Boulogne 268
Bordeaux 260–268
Compagnie des Messageries Maritimes, 260; Chargeurs Réunis, 260; Nouvelle Compagnie Bordelaise, Compagnie Havraise Péninsulaire, General Steam Navigation Line, La Sociétié Générale Transports Maritimes, Bordeaux-Liverpool Line, Compagnie des Bateaux à Vapeur du Nord, Compagnie Royale Néerlandaise de Navigation, 261; passenger rates, 262; freight rates, 263–265.
Calais 267
Dunkirk, regular lines 265–267
Havre 257–260
Compagnie Générale Transatlantique, 257; Compagnie des Chargeurs Réunis, Compagnie Havraise Péninsulaire, 258; Service Maritime de la Maison Worms; Jens, Meinich & Co.; Havre-Bilbao Lines, Chevillotte Frères, Compañía Transatlántica, etc., 259; passenger rates from Havre, 259, 260; freight rates, 260.
La Pallice 269
Marseilles 247–257
French lines: Messageries Maritimes, 247; Compagnie Nationale, 248; Fraissinet et Cie, 249; Sociétié Générale de Transports Maritimes, 250; Compagnie Générale Transatlantique, Compagnie de Navigation Mixte, 552; Compagnie Costaldi, 253; Société Navale de l'Ouest. Foreign lines: The Anchor, the Johnston, the Bibby, the United Steamship, the Hall, the Peninsular and Oriental, the Sloman, the Svenska Lloyd, 254; the Ybarra, the Compagnie Transatlantique de Barcelona, the Rotterdam Lloyd, the Adria, La Compagnie Sévillane, the Persian Gulf, the Compagnie Italienne, Compagnie Russe, Compagnie Fluviale, Compagnie Panhellénique, Compagnie Valencia, Navigazione Generale Italiana, tramp steamers, 255; navigation in 1893, 255; passenger rates from Marseilles, 256; freight rates from Marseilles, 257.
Rouen 269
Germany 306–312
German registered tonnage, 306; German vessels entering and clearing at German ports, 307; ports of the German Empire and shipping thereat; German subsidized steamship companies, 308. Bremen and Hamburg lines; North German Lloyd, 309; Hamburg-American Packet Company, 312. Tonnage of German steamers, 314.

EUROPE—Continued. Page.
Gibraltar (North German Lloyd, Hamburg-American, and miscellaneous lines) 304
Greece 386, 387
Panhellenic Steam Navigation Line, 386. Foreign lines: French, Austrian, Italian, Egyptian, and Russian, 387.
Holland 238, 239
Netherlands-American Steamship Line, 238; Royal West Indian Mail Service; Netherlands Steam Navigation Company, 239.
Italy 355, 368–375
Subsidized lines; Navigazione Generale Italiana, 355; Puglia Steamship Line, Sicilian Line, Veloce Steamship Line, 357; foreign lines, 357.
Genoa 368–371
New York-Genoa-Gibraltar Line, 368; Navigazione Generale Italiana, La Veloce Line, North German Lloyd, Peninsular and Oriental, Netherlands Steamship Lines, 370, 371.
Palermo 373–375
Phelps Line, Wilson Line, Glynn Line, Cunard Line, Sloman Line, 373; Cockerill Line, Leyland Line, Anchor Line, Adria Line, Koninklyke Nederlandsche Stoomboot Maatschappy, General Steam Navigation Company, 374; Navigazione Generale Italiana, 375.
Malta 377–385
Peninsular and Oriental Line, 377; Clan Line, 379; Deutsche Levant and Royal Hungarian Lines, 380; Transatlantic and Wilson Lines, 381; Papayanni and Leyland Lines, 382; Cunard, Moss, and City Lines, 383; Italian General Navigation, Florio, Rubattino, and Wescott Lines, 384; Gollcher & Sons' Line, 385.
Norway 422–423
Thingvalla Line, Wilson Line, Lloyd's Line, Norwegian Line, Sóndenfjelske Line, 422; Ostlandske Lloyds Line, United Danish Steamship Line, Södra Sverige Line, 423.
Russia (Odessa) 408, 409
La Compagnie Russe de Navigation à Vapeur, other lines, 408. Subsidized lines: Volunteer Fleet, and Gagarine Line, 408; Austrian Lloyds; French and Italian Lines, 409.
Spain (Barcelona) 282–298
La Compañía Transatlántica, 282–285; Philippine Line, 285–287; Fernando Po Line, 287; Morocco Line, Tangier Line, 288; Pinillos-Saenz Line, Prats Line, 289; Serra y La Flecha Line, Italian Line, Knott's Prince Line, 290; Compagnie Générale Transatlantique, Compañía Higonesa, 291; Vapores Correos Mallorquines, Vapores Sloman, 292; Compañía Valenciana de Navegacion, Société Navale de l'Ouest, Compañía Sevillana, 293; Vapores Espalin & Co., 294; Ybarra Line, Tintoré y Cia Line, 294; Compañía Bandera Española, Larrinaga Line, United Steamship Line, 296; La Veloce Line, Hamburg-American Line, 297; miscellaneous steamers, 298.
Sweden (Swedish merchant service) 426
Turkey (Constantinople) 390, 391
Khedive Mail Line, Austrian Lloyds, Russian Line, Messageries Maritimes, 390; Fraissenet Line, Paquet Line, Panhellenic Line, Turkish Line, English lines, 391.
United Kingdom—
England—
Liverpool 189, 190
American Line, Bibby Line, White Star Line, Atlás Line, McIvor & Nelson Line, Booth Line, Macandrew Line, Swedish Line, McIlwraith-McEacharn Line, 187; Houlder Line, Cunard Line, Pacific Line, Anchor Line, Johnson Line, Leyland Line, Mississippi and Dominion Steamship Line, Chesapeake and Ohio Line, West India and Pacific Steamship Line, 190.

EUROPE—Continued.
United Kingdom—Continued.
England—Continued.
Page.
London 190–196
Orient Line, 190; McIlwraith-McEacharn Line, Peninsular and Oriental Line, Bibby Line, New Zealand Shipping Line, Castle Line. Aberdeen Line, 191; Macandrew Line, Anglo-Australasian Steam Navigation Line, Aberdeen Line; Shaw, Sevill & Albion Line, Houlder Line, National Line, 192; Red Cross Line, Wilson Hill Line, Atlantic Transport Line, Furness Line, 196.
Southampton 193, 194
American Line, North German Lloyd, Royal Mail Steam Packet Line, 193; Union Line, 194.
Ireland (Belfast) 222, 223
Lord Line, Head Line, Liverpool Line, Fleetwood Line, 222; Glasgow Line, general statistics of lines, 223.
Scotland (Glasgow) 204–208
Allan, Anchor, and Donaldson Lines, United States, 204–208.
Wales (Cardiff and Swansea) 195–197
POLYNESIA:
Fiji 650–652
United Steam Navigation Company, 650; Union Steamship Company of New Zealand, 651; Canadian-Australian Line, 652.
Hawaiian Islands 657, 658
New Caledonia (Noumea) 630
Tahiti (American Line and New Zealand Line) 654

7. RAILWAYS.

[History, cost of construction, termini and main points touched, length of lines and distances between main points, condition of lines, number and gauge of tracks, frequency of communication, freight and passenger rates, obstacles overcome in construction of lines, grades, viaducts, bridges, etc.]

AFRICA:
British Africa—
Cape Colony 472
Mauritius 457
Natal 478, 479
Sierra Leone (proposed railway) 510
French Africa—
Algeria 431–436
Senegal 513
Tunis 441
German Africa—East African Possessions 494
Kongo Free State 505
Madagascar 452
Portuguese Africa—
Angola 497
Mozambique 462, 463
Delagoa Bay Railway and Transvaal extension, 462; Beira Railway, 463, 467.
Orange Free State 473-476
Turkey in Africa—Egypt 448, 449
Zanzibar 470
AMERICA:
Intercontinental Railway (routes, surveys, concessions, etc.) 88
Canada (system and mileage of the Dominion) 19

AMERICA—Continued.
Canada—Continued. Page.
British Columbia (Esquimalt and Nanaimo) 30
Manitoba 31–33
Northern Pacific. Canadian Pacific, 31; Great Northern, 33.
New Brunswick (Canadian Pacific, Intercolonial, Shore Line) 36
Newfoundland 38
Nova Scotia 37
Prince Edward Island 40
Ontario 33, 34
Canadian Pacific 33; Canada Atlantic, 34.
Central America—
British Honduras 73
Costa Rica 78
Guatemala 72
Honduras 73
Nicaragua 76
Mexico 42–58
Mexican, 42; Mexican Central, 43; Mexican National, 45; Monterey and Mexican Gulf, 49; Mexican Southern; Hidalgo and Northwestern, 50; Sonora, 51; Alvarado, 52; Manzanillo and Colima, Sinaloa and Durango, 53; Tehuantepec, 54; Tehuantepec Railway, and the Tehuantepec and Panama Canals as trade routes, 55; minor railways, 56; Merida and Progreso, 56; Merida and Peto, Merida and Valladolid, Merida and Campeche, 57; Merida and Izamal, 58.
South America:
Argentine Republic 150–152
Buenos Ayres, Rosario and Tucuman, 150; Eastern Argentine, Buenos Ayres and Great Western, 151; Buenos Ayres and Southern, 152.
Bolivia 128–133
Antofagasta and Bolivia, 129; railway connections; Arica Railway; Mollendo and Puno, 131.
Brazil (lines in operation and lines projected) 113, 729
Names, termini, gauge, length of lines, results of traffic during the year 1892, lines under Government and State supervisions, guaranteed capital, etc., etc., 729–741.
British Guiana 107, 696
Chile 136, 137
State lines, 136; private lines, 137.
Colombia (Panama Railway) 98
Ecuador 120
Paraguay 141
Peru 121–125
Entire system turned over to an English company, 121; termini and intermediate points of system, 122; Henry Meiggs and William Henry Crilley, builders of Peruvian railways, 124.
Uruguay 145, 146
Ferrocarril Central del Uruguay, 145; Nordeste; Extension Este; Noroeste; Midland; Norte del Uruguay; Del Norte, 146.
Venezuela 104–106
Mileage in operation; contemplated lines, 104; Ceiba railway extension; Encontrado to La Fria, 105; Maracaibo to Periga, 106.
West Indies:
Cuba 83
Haiti 85
Jamaica 86
Porto Rico 86

ASIA:

British Asia— Page.

Ceylon 570–577

India 543–570

History of Indian railways, 543–548; standard dimensions, 548–553; length of lines, 553; expenditures, 554; fares and freights, 555; the several lines and their ownership, 556; Indian railway acts governing inspectors, 557; traffic facilities, 558; Government ownership, 559; acknowledgments for statistics supplied, 560.

Western India railways: Great Indian Peninsular; Bombay, Baroda and Central India; Southern Mahratta, 569; Indian Midland, 570.

China 598, 607

Dutch India—

Java 594, 595

State railways, 594; private railways, 595.

Sumatra (State and private lines) 596

Japan 612

Malay States 585–590

Selangor railways, 585–588; Sungie Ujong railways, 588–590; Perak railways, 590.

Spanish Asia—Philippine Islands 618

Turkey in Asia—

Asia Minor 517

Palestine 530

Syria 525

AUSTRALASIA:

New South Wales 623

New Zealand 648

Victoria 637

EUROPE:

Austria-Hungary—

Austria 338–343

Under Government contract, 338; the Südbahn, 339; the Nordbahn, 340; Staats-Eisenbahn-Gesellschaft; Austrian State, 341; fares and freight rates, 342, 343.

Bohemia 344–346

State railways; private railways, 344; condition and passenger rates, 345; zone divisions and freight rates, 346.

Hungary 348–353

Royal Hungarian State railways; Imperial and Royal Incorported Southern, 348–349; zone traffic, 350–352; international transit; grades, tunnels, and bridges, 352.

New tariff rates 702

Belgium 234, 235

Bulgaria 392

Denmark 244, 245

Ownership; south line; west line, 244; north line; freights, fares, and traffic, 245.

England. (*See* United Kingdom.)

France 270–278

General system, 270; termini and main points touched, 272–276; train accommodations and charges, 276; express and freight rates; condition of lines, 277; accidents; engineering difficulties, 278.

Germany 315–334

State railways, 315, 316; private railways under Government control, 316; private railways under private management, 317–319; administration, 319; traffic, charges, etc., State railways, 320, 321; administration, traffic, charges, etc., private railways, 322; railways converging at Frankfort on the Main, 327–330; Luxemburg railways, 331–334.

EUROPE—Continued. Page.
Gibraltar 303
Great Britain and Ireland. (*See* United Kingdom.)
Greece 387–389
Holland 235–238
System, 235; State railway—termini, traffic, charges, routes, points touched, etc., 235-237; Dutch railway—length, capital, dividends, termini, traffic, etc., 237, 238.
Ireland. (*See* United Kingdom.)
Italy 359–376
Early railways and laws providing for the building of railways, 359; Mediterranean system, 360; Adriatic system, 361; Sardinian railway and traffic, 362; management, freight charges, fares, etc., 363; railways converging at Genoa, 372; railways converging at Palermo, 376.
Luxemburg 331
Malta 386
Norway 424
Russia 395–420
St. Petersburg-Moscow-Nizhni-Novgorod (Nicholaevsk) line; St. Petersburg-Warsaw line; Baltic Railway; Finland Railway: termini and main points, 395, 396; tracks; communication; passenger rates, 397, 405; new zone system; freight charges, 398, 405; classification of freight, 399–402; differential rates, 402; ownership and length of lines, 403, 404; Government regulations, 406; Great Siberian Railway: History of, 409; geographical and technical features, 411; estimate of cost of, 414; progress of construction, 415; miles of rails laid, 418. Finland State railways, 418–420.
Spain 298, 299, 700–702
First railway in; Tarragona, Barcelona and Frontier of France Railway, 298; Barcelona, Reus and Saragossa Railway, 299; tunnels and bridges, 700-702; engineering difficulties, 702.
Sweden 425
Switzerland 335–336
Northeastern line and United Swiss line—cost, traffic, etc., 335; speed and accommodation, freight rates, engineering difficulties, 336.
Turkey 389, 390
United Kingdom (mileage, capital, passengers conveyed, and traffic) ... 165
England 153–166
System, origin, development, etc., 153–156; Lancashire and Yorkshire Railway, 156; Manchester, Sheffield and Lincolnshire Railway, 157; railway carriages and wagons, 157; rates of freight, 158–165; early English railways, 166.
Ireland 215–219
System, carriages, speed, improvements, etc., 215; Great Northern Railway, 216; Belfast and Northern Counties Railway, 218; Belfast and County Down Railway, 219.
Scotland 210–214
Caledonian Railway, 210-212; Glasgow and Southwestern, 212, 213; North British Railway, 213; West Highland Railway, 214.
Wales 197–201
Welsh railways—trade, traffic, condition, etc., 197–199; passenger and freight rates, 199; speed of trains, character of service, 200; grades, bridges, and tunnels, 201.
POLYNESIA:
Fiji 653
Hawaiian Islands 655

MISCELLANEOUS.

American trade opportunities in Uruguay 145
Bank in Central Africa 486

Page.

Caravans and caravan trade:
Egypt 450
Persia 541
Somali Coast 468
Tripoli 443
Caravansaries in Persia 534
Coal fields of Wales 194
Cotton exports for German East Africa 496
Engineering difficulties:
Ceylon, railway 573
China 597, 601
Grand canal, 597; old highways, 601.
France, railway 278
Hungary, railway 352
India (Midland Railway) 570
Italy (Genoa Railway) 371
Japan, railway 613
Java, railway 564, 565
Mont Cenis Tunnel 363
Russia (Great Siberian Railway) 411–413
Spain, railway 259, 702
Syria (Lebanon Mountain Railroad, grades) 526
Free transit in German East Africa 496
Geography and topography:
Angola 497
British Central Africa 480
German Africa—
Cameroons 491
East Africa 493
Southwest Africa 493
Togoland 489
Kongo Free State 502
Lower Kongo 506
Mexico 41
Paraguay 139
Senegal 513
Siberian Railway 409–414
Somali Coast 468
German Africa, five times as large as Germany 489
Colonial empire 489
Rule in Togoland, ten years of 491
Horses, cattle, etc., in Central Africa 486
Indian traders in Central Africa 487
Interior transportation other than by rail or water:
Angola (Loando and Dondo native carriers) 498-501
Bolivia (mules, burros, etc.) 130, 133–135
China (to the Ming tombs and Great Wall) 608
Kongo Free State (native carriers) 503
Madagascar 451
Maskat (donkey conveyances) 532
Mexico (stage lines) 69
Morocco (camels, mules, and donkeys) 427
Palestine (horses, camels, etc.) 531
Somali Coast (camels and donkeys) 468
Syria (diligences on the Damascus road) 527
Parcels post in Central Africa 487

Ports and harbors: Page.
Belgium (Antwerp) 224
British Africa 459, 468, 487
Chinde, 487; Port Louis, 459; Somali Coast, 468.
Colombia 89, 102
Panama, 89; other ports, 102.
France 260–269
Bordeaux, 260; Boulogne, 268; Calais, 269; Dunkirk, 265; Havre, 25; Marseilles, 247; Rouen, 269.
French Africa 437, 440
Algiers, 437; Bizerta, 440.
Germany 308
Italy (Genoa, changes in commerce) 368
Malay States (Klang) 585
Mexico 62–64
Matamoras, Tampico, Tuxpan, Vera Cruz, Alvarado, Anton Lizardo, Tlacotalpam, 62; Minatitlan, Frontera, Campeche, Carmen, Sisal, Progreso, San Benito, Tonala, Ventosa, Salina Cruz, Huatulco, 63; Puerto Angel, Acapulco, Manzanillo, Chamela, San Blas, Mazatlan, Altata, Playa Colorado, Guaymas, La Libertad, Pichillingue, La Paz, Ensenada, 64.
New Brunswick (St. John) 35
New South Wales (Sydney) 620
Portuguese Africa 464, 497
Beira, 464; Loanda, 497.
Russia (St. Petersburg) 393
Spain (Barcelona) 282
Venezuela (La Guayra) 104
Wales (Cardiff) 194
Postal facilities and rates:
Central Africa 485–488
German Africa 490, 492, 494
Morocco 430
Natal Railway 479
Persia (Teheran) 542
Posthouses in Persia 535
Slave trade in Nyassaland, blocking the 488
Steam marine:
German 314
Russian (Volunteer fleet) 407
Spanish 301
Swedish 426
United States 694–696
Telegraph:
Bolivian 133
Central Africa (British) 486
Cuban 83
German Africa 490, 491, 494
Luxemburg 334
Mileage of the world 17
Mozambique 467
Venezuela 104
Tsetse fly in Central Africa 483

CONTRIBUTORS.

Adams, Charles L. (consul, Cadiz) 301
Adams, jr., Robert (minister, Rio de Janeiro) 108
Baker, E. L. (consul, Buenos Ayres) 146

	Page.
Barclay, J. Judson (consul-general, Tangier)	427
Bell, George W. (consul, Sydney)	620
Benedict, C. H. (consul, Cape Town)	471
Bowen, Herbert W. (consul, Barcelona)	282
Bureau of American Republics	130
Campbell, John P. (consul, Port Louis)	457
Chatelaine, Heli (commercial agent, Loanda)	497
Connolly, John D. (consul, Auckland)	639
Crawford, J. M. (consul-general, St. Petersburg)	409
Crittenden, Thomas J. (consul-general, City of Mexico)	41
De Kay, Charles (consul-general, Berlin)	305
Derby, John S. (consul St. John, N. B.)	35
Dobbs, James M. (consul, Valparaiso)	136
Dillard, George G. (consul-general, Guayaquil)	121
Donner, Herman (consul, Helsingfors)	418
Doty, J. Lamb (consul, Tahiti)	654
Downes, Edward (consul, Amsterdam)	235
Duffie, M. M. (consul, Winnepeg)	31
Durham, John S. (consul-general, Port au Prince)	85
Eckford, Q. O. (consul, Kingston, Jamaica)	87
Elliott, Isaac M. (consul, Manila)	618
Estes, William R. (consul, Kingston, Jamaica)	86
Flagg, Eben M. (vice-consul, Asuncion)	139
Fletcher, James (consul, Genoa)	368
Gade, Gerhard (consul, Christiania)	422
Gibson, Thomas R. (consul, Beirut)	522
Grant, Louis B. (acting consul-general, Cairo)	447
Grellet, Charles E. (consul, Algiers)	431
Grout, J. H. (consul, Bermuda)	81
Hammond, Edward P. T. (consul, Budapest)	348
Heenan, Thomas E. (consul, Odessa)	403
Hernandez, F. Figuero (vice-consul, Madrid)	698
Hill, George (vice-consul-general, Halifax)	37
Hollis, W. Stanley (consul, Mozambique)	460
Horton, George (consul, Athens)	386
Howells, Anthony (consul, Cardiff)	194
Hunt, W. E. (consul, Hongkong)	608
Hiirner, Rudolph (vice-consul, Bagdad)	518
Jastremski, Leon (consul, Callao)	121
Jernigan, T. R. (consul-general, Shanghai)	597
Johnson, Harvey (consul, Antwerp)	224
Jonas, Charles (consul-general, St. Petersburg)	393
Jones, T. C. (consul, Funchal)	514
Jones, Wallace S. (consul-general, Rome)	355
Kane, Dominic J. (consul, Charlottetown)	38
Karel, John (consul, Prague)	344
Karel, John (consul-general, St. Petersburg)	403, 418
Kennedy, D. C. (consul, Malta)	377
Kirk, Robert J. (consul, Copenhagen)	240
Landgraf, E. R. (consular agent, Bloemfontein)	473
Leitch, James (consul, Belize)	72
Le Mescam, L. (consul, Noumea)	650
Lewis, Judson A. (consul-general, Sierra Leone)	508
Little, John M. (consul, Tegucigalpa)	73

	Page.
McIvor, N. W. (consul-general, Kanagawa)	611
Mackirdy, A. (vice-consul, Maskat)	531
Maratta, Daniel W. (consul-general, Melbourne)	627
McLain, jr., Thomas J. (consul, Nassau)	78
Madden, J. H. (consul, Smyrna)	517
Malloy, Thos. (consul, St. Johns, N. F.)	38
Martin, Henry W. (vice-consul, Barcelona)	282
Mason, Dean B. (vice-consul-general, Vienna)	338
Mason, Frank E. (consul-general, Frankfort on the Main)	327
Mathews, F. A. (consul-general, Tangier)	427
Mills, Ellis (consul-general, Honolulu)	657
Mohun, E. Dorsey (commercial agent, Boma)	502
Morey, W. (consul, Colombo)	570
Morris, Edward (vice commercial agent, Levuka)	650
Morris, Henry C. (consul, Ghent)	16, 703
Morse, Allen E. (consul, Glasgow)	204
Morss, Samuel E. (consul-general, Paris)	246
Murphy, George H. (consul, Luxemburg)	331
Myers, Levy W. (consul, Victoria)	37
O'Hara, Thomas (consul, San Juan del Norte)	75
O'Neil, Thomas E. (consul, Stockholm)	426
Penfield, Frederic C. (consul-general, Cairo)	450
Plumacher, E. H. (consul, Maracaibo)	103
Polk, Van Leer (consul-general, Calcutta)	543
Pollock, Alexander L. (consul, San Salvador)	74
Pratt, E. Spencer (consul-general, Singapore)	578
Pringle, D. Lynch (consul-general, Guatemala)	71
Rairden, B. S. (consul, Batavia)	591, 596
Read, Sheridan P. (consul, Tientsin)	604
Richman, Irving B. (consul-general, St. Gall)	335
Riley, John B. (consul-general, Ottawa)	33
Schnéegans, E. (commercial agent, Saigon)	617
Schramm, Edgar (consul, Montevideo)	144
Seymour, William H. (consul, Palermo)	373
Short, Luther (consul-general, Constantinople)	389
Sommer, jr., H. J. (consul, Bombay)	562
Spaight, James (vice-consul, Demerara)	106
Sprague, Horatio I. (consul, Gibraltar)	303
Stewart, Lewin R. (consul, San Juan, Puerto Rico)	86
Taney, James B. (consul, Belfast)	215
Tyler, John (vice-consul-general, Teheran)	532
Thompson, Thomas J. (minister, Rio de Janeiro)	112
Vifquain, Victor (consul-general, Panama)	89
Van Praag, Eli (vice-consul, Paramaribo)	696
Wallace, Edwin S. (consul, Jerusalem)	527
Wetter, Edward Telfair (acting consul, Tamatave)	451
Williams, Harrison R. (consul, San Jose, Costa Rica)	78
Williams, Ramon O. (consul-general, Havana)	81
Zalles, Gerardo (consul, La Paz, Bolivia)	128

BSB Bayerische StaatsBibliothek
MDZ Münchener DigitalisierungsZentrum Digitale Bibliothek

House documents

Bd.: [470.] 1895/96, Vol. 37 = Congress 54, Sess. 1

Washington, DC 1895
Am.b. 3040-470,37
urn:nbn:de:bvb:12-bsb11799725-7